Vol. 1021 Number 3

OFFICIAL GAZETTE

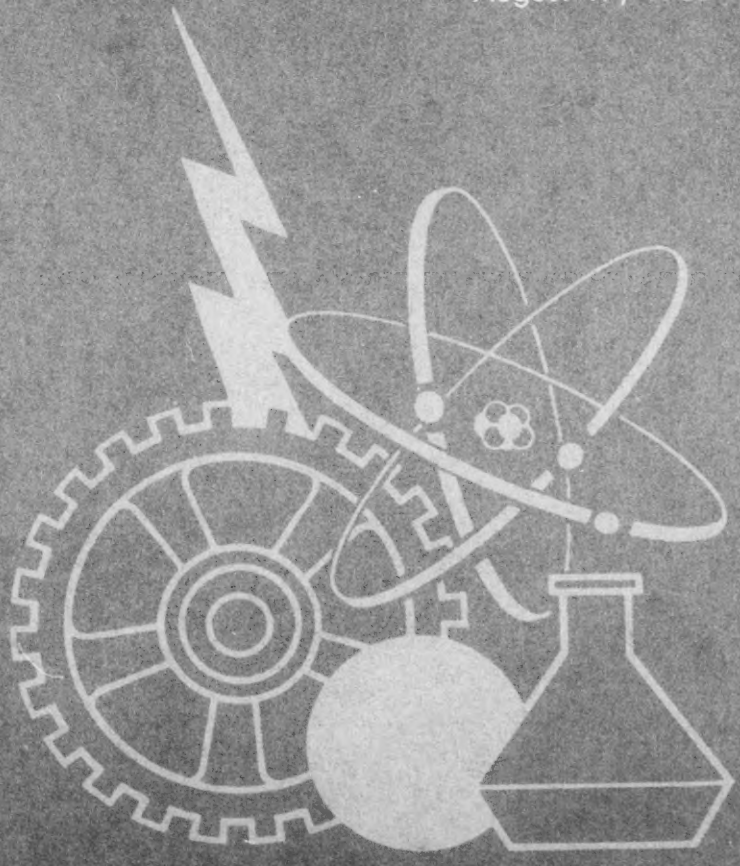
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

August 17, 1982



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

August 17, 1982 Volume 1021 Number 3

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1021 OG 96
Reissue Applications Filed	1021 OG 96
Request for Reexaminations Filed	1021 OG 96
Acknowledgement of Receipt of a Patent or Trademark Application	1021 OG 96
Errata	1021 OG 96
Adverse Decisions in Interference	1021 OG 96
Notice of Availability for Licensing	1021 OG 97
Patent Certificates of Correction	1021 OG 98
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1021 OG 99
Condition of Patent Applications	1021 OG 100
Reissue Patents Granted (31,011)	737
Plant Patents Granted (4,876)	739
Patents Granted	
General and Mechanical (4,344,189)	741
Chemical (4,344,762)	939
Electrical (4,345,106)	1037
Design Patents Granted (265,775)	1117
Index of Patentees	PI 1
Indices of Reissue, Designs and Plant Patentees	PI 40
Classification of	
Patents (Including Reissues)	PI 43
Designs and Plants	PI 45
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 46
Designs and Plants	PI 47
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS AND DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries and the most recent PCT rule changes see the notices appearing in the Official Gazette at 1001 O.G. 14 on Dec. 9, 1980 and at 1012 O.G. 20 on Nov. 17, 1981.

Note that the international fees have been increased as of Jan. 1, 1982. The current schedule of fees is as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Fees	
Basic Fee (first 30 pages)	270.00
Basic Supplemental Fee (for each sheet over 30)	6.00
Designation Fees	65.00

GERALD J. MOSSINGHOFF,
Jan. 19, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,859,437, Re. S.N. 376,917, Filed May 10, 1982, Cl. 424/238, REDUCING CHOLESTEROL LEVELS, Alan H. Weigand, Owner of Record: *Intellectual Property Development Corp., New Rochelle, N.Y.,* Attorney or Agent: William H. Saltzman, Ex. Gp.: 125

4,256,969, Re. S.N. 320,337, Filed Nov. 12, 1981, Cl. 250/566, GRAPHICAL REPRESENTATION TRANSDUCING, Thomas A. Lianza, Owner of Record: *Inventor,* Attorney or Agent: Charles Hieken, Ex. Gp.: 252

4,257,844, Re. S.N. 354,033, Filed Mar. 2, 1982, Cl. 162/305, PRESS SECTION ARRANGEMENT, Arnold J. Schmitt, et al., Owner of Record: *Beloit Corp., Beloit, Wis.,* Attorney or Agent: James Van Santen, et al., Ex. Gp.: 173

4,296,623, Re. S.N. 382,595, Filed May 27, 1982, Cl. 72/227, SEMI-CONTINOUS HOT ROLLING OF METAL STRIP AND PLATES, Werner W. Eibe, Owner of Record: *White Consolidated Industries, Inc., Pittsburgh, Pa.,* Attorney or Agent: Gordon R. Harris, et al., Ex. Gp.: 321

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

There are no publications this issue.

Acknowledgement of Receipt of a Patent or Trademark Application

When early notification of the serial number of newly filed application papers is desired, a *stamped, self-addressed post card* should be submitted with each application. Immediately after the mail has been opened in the Patent and Trademark Office, the post card will be stamped with both the receipt date and the serial number, and then returned to the addressee.

Within recent months, hundreds of cards could not be successfully returned because of insufficient postage or incomplete or nonexistent forwarding addresses. Accurate and complete addresses, including ZIP codes, are necessary to ensure prompt acknowledgement of the receipt of patent and trademark applications.

To assist in easy identification once the post card has been returned, it is suggested that the post card include applicant's names and title of invention.

When more than one set of application papers is filed under one cover, a return post card should be attached to each set of papers for which a receipt is desired.

THERESA A. BRELSFORD,
July 19, 1982. *Acting Assistant Comissioner for Adminstration.*

Errata

In the Official Gazette of Oct. 20, 1981 under TRADEMARK REGISTRATIONS CANCELLED, Section 8, on page TM 477, "1,011,635. MISCELLANEOUS DESIGN. (Int. Cl. 29). Reg. 5-27-75." should be deleted.

In the Official Gazette of Nov. 17, 1981, on page TM 8, line 51, "Fisher and Co., Newark, N.J. 702,225, ren. 11-17-81. U.S. Cl. 28. (Int. Cl. 14)." should be deleted and "Robert S. Fisher & Co., Inc., Newark, N.J. 702,225, ren. 11-17-81. U.S. Cl. 28. (Int. Cl. 14)." should be inserted.

In the Official Gazette of Nov. 24, 1981, under TRADEMARK REGISTRATIONS-NEW CERTIFICATES, on page TM 525, "1,012,141. PRINCE OF LIGHT. (Int. Cl. 11). David Pletz, Bellflower, Calif. Reg. 6-3-75. New Cert. Sec. 7(c) to David J. Pletz, Bellflower, Calif." should be deleted and "1,012,141. PRINCE OF LIGHT. (Int. Cl. 11). David Pletz & Daniel L. Stefani, Bellflower, Calif. Reg. 6-3-75. New Cert. Sec. 7(c) to David J. Pletz, Bellflower, Calif." should be inserted.

In the Official Gazette of Dec. 1, 1981, on page TMI 13, line 20, "Paul Metz, a.k.a. Metz Apparatewerke, Ritterstrasse, Fed. Rep. of Germany. 716,099, ren. 12-1-81. U.S. Cl. 26. (Int. Cl. 9)." should be deleted and "Paul Metz, a.k.a Metz Apparatewerke, Fuerth/Bayern, Fed. Rep. of Germany. 716,099, ren. 12-1-81. U.S. Cl. 26. (Int. Cl. 9)." should be inserted.

In the Official Gazette of Apr. 20, 1982, on page TMI 1, line 47, "Berol Co., Eagle Pencil Co., Danbury, Conn. 728,846, ren. 4-20-82. U.S. Cl. 37. (Int. Cl. 16)." should be deleted and "Berol Corp., Eagle Pencil Co., Danbury, Conn. 728,846, ren. 4-20-82. U.S. Cl. 37. (Int. Cl. 16)." should be inserted.

Adverse Decisions in Interference

In the designated interference involving the indicated

claims of the following patents, final decisions having been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,758,764, Kermit I. Harner, TURBINE POWER PLANT CONTROL WITH AN ON-LINE OPTIMIZATION, Interference No. 100,445, decided May 5, 1982, claims 1 & 3.

Patent No. 3,764,785, Kermit I. Harner and Roy Schneider, TURBINE POWER PLANT CONTROL SYSTEM, Interference No. 100,444, decided May 5, 1982, claims 1-4.

Patent No. 3,901,732, Tibor Kalnoki Kis and Thomas A. Reilly, THIN FLAT CELL CONSTRUCTION HAVING A GAS-PERMEABLE COATED PERFORATED ANODE, Interference No. 99,859, decided Mar. 4, 1982, claims 1, 2, 5, 6, 9, 10, 13, 14, 17, 18, 21 & 22.

Patent No. 3,902,922, Tibor Kalnoki Kis, CONDUCTIVE COATED VENTED CATHODE COLLECTOR FOR THIN FLAT CELLS, Interference No. 99,858, decided Mar. 4, 1982, claims 1, 4, 5, 6, 9, 10, 11, 14 & 15.

Patent No. 3,986,423, David Philip Rossum, POLYPHONIC MUSIC SYNTHESIZER, Interference No. 100,097, decided June 16, 1982, claim 16.

Patent No. 4,161,221, Carl-Gustaf Carlin and Stefan Mikael Bertil Skyllermark, METHOD AND APPARATUS FOR PRETENSIONING SCREW JOINTS. Interference No. 100,527, decided May 11, 1982, claims 1, 2 & 6.

Patent No. 4,233,490, Alexander N. Shalai, Mikhail D. Nikitin, Nikulai I. Zakharov and Anatoly P. Bratchenko, METHOD OF REINFORCING ALUMINIUM ALLOY PISTON RING GROOVE, Interference No. 100,774, decided May 25, 1982, claims 1 & 3.

Patent No. 4,256,063, Masaharu Sumiyoshi, Setsuro Sekiya and Katsuhiko Motosugi, INTAKE SYSTEM OF A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE, Interference No. 100,770, decided May 25, 1982, claims 1-3, 8-10 & 14-20.

NANNIE B. HENRY,
Deputy Clerk,
Board of Patent Interferences.

National Technical Information Service

U.S. GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of government Inventions and Patents
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents
National Technical Information Service
U.S. Department of Commerce.

SN 6-132,597. (Patent 4,333,757) MUSHROOM-GROWING MEDIUM. Dept. of Agriculture.

SN 6-115,651. (Patent 4,335,432) OPTIMAL VEHICLE FOLLOWING CONTROL SYSTEM. Dept. of Transportation.

SN 6-193,877. (Patent 4,331,881) FIELD CONTROL FOR WIND-DRIVEN GENERATORS. Dept. of Agriculture.

SN 6-174,239. (Patent 4,331,054) ELECTRIC GEL SLICER. Dept. of Health & Human Services.

SN 6-190,064. (Patent 4,331,648) N-ACETYL-CYSTEINE PROTECTS AGAINST CARDIAC DAMAGE FROM SUBSEQUENTLY-ADMINISTERED CARDIO-TOXIC ANTHRA-CYCLINE IN CANCER THERAPY. Dept. of Health & Human Services.

SN 6-195,539. (Patent 4,331,975) INSTRUMENTATION FOR SURVEYING UNDERGROUND CAVITIES. Dept. of the Interior.

SN 6-186,381. (Patent 4,331,021) CONTRAST RESOLUTION TISSUE EQUIVALENT ULTRASOUND TEST OBJECT. Dept. of Health & Human Services.

SN 6-195,188. (Patent 4,332,244) MASK FOR THE SAFE DELIVERY OF INHALATION GASES TO SMALL LABORATORY ANIMALS. Dept. of Health & Human Services.

SN 6-370,018. PREPARATION OF ACYLUREA COMPOUNDS. Dept. of Agriculture.

SN 6-356,865. PROCESS AND COMPOSITIONS FOR PRESERVING FRESH HIDES AND SKINS. Dept. of Agriculture.

PATENT NOTICES

Certificates of Correction for the Week of Aug. 17, 1982

D. 256,021	4,275,314	4,315,346	4,327,180
D. 258,677	4,275,427	4,315,392	4,327,227
D. 263,869	4,276,311	4,315,514	4,327,274
D. 264,103	4,276,529	4,315,656	4,327,553
D. 264,793	4,278,748	4,315,901	4,327,797
D. 264,844	4,280,005	4,315,921	4,327,828
3,609,300	4,282,812	4,317,676	4,327,941
3,823,749	4,282,845	4,318,491	4,328,235
4,029,629	4,284,395	4,318,583	4,328,327
4,029,681	4,288,619	4,318,597	4,328,390
4.073,468	4,290,644	4,318,902	4,328,471
4,105,766	4,290,763	4,319,473	4,329,439
4,126,620	4,290,936	4,319,606	4,329,490
4,208,690	4,294,911	4,320,879	4,329,752
4,209,817	4,297,891	4,321,114	4,330,306
4,210,937	4,298,261	4,321,131	4,330,489
4,218,749	4,298,655	4,321,297	4,330,564
4,221,350	4,298,684	4,321,601	4,330,648
4,222,963	4,298,709	4,321,847	4,330,719
4,230,403	4,298,803	4,321,850	4,330,757
4,231,790	4,298,822	4,321,851	4,331,521
4,234,565	4,298,906	4,322,325	4,331,577
4,235,724	4,299,441	4,322,333	4,331,800
4,236,978	4,300,958	4,322,665	4,331,912
4,238,500	4,301,033	4,322,801	4,332,037
4,244,964	4,303,487	4,322,870	4,332,189
4,247,163	4,303,720	4,322,941	4,332,271
4,247,517	4,303,816	4,323,112	4,332,396
4,248,002	4,305,260	4,323,296	4,332,453
4,248,712	4,305,274	4,323,577	4,332,461
4,250,051	4,305,745	4,323,606	4,332,466
4,250,464	4,305,808	4,323,624	4,332,597
4,251,353	4,305,870	4,323,733	4,332,766
4,253,620	4,305,945	4,323,771	4,332,785
4,254,647	4,305,971	4,323,864	4,332,822
4,255,281	4,305,972	4,324,515	4,333,377
4,255,430	4,306,773	4,325,094	4,333,552
4,256,163	4,307,810	4,325,741	4,333,852
4,256,855	4,308,598	4,325,987	4,333,913
4,258,145	4,309,369	4,326,034	4,333,997
4,264,630	4,309,720	4,326,067	4,334,780
4,264,631	4,309,826	4,326,076	4,334,958
4,264,632	4,311,312	4,326,124	4,335,081
4,264,661	4,313,483	4,326,238	4,335,154
4,268,570	4,313,834	4,326,980	4,335,183
4,270,531	4,314,070	4,327,009	4,335,356
4,272,446	4,314,098	4,327,145	4,336,229
4,272,862	4,314,215	4,327,147	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2865
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF June 26, 1982

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-23-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-09-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-18-81
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	4-20-81
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-05-81
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	8-11-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	9-18-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-20-80
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	12-07-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-26-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director Industrial Arts; Household, Personal and Fine Arts.	6-30-80
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	10-30-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	9-26-80
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	2-13-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	6-02-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	7-25-80

Expiration of patents: The patents within the range of numbers indicated below expire during June 1982, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,186,004 to 3,192,535, inclusive

Plant Patents ..... Numbers 2,522 to 2,542 inclusive

REISSUES

AUGUST 17, 1982

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,011

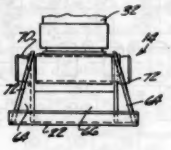
LANDING GEAR CONSTRUCTION

Jack T. Belke, Grand Rapids, Mich., assignor to Westran Corporation, Muskegon, Mich.

Original No. 4,004,830, dated Jan. 25, 1977, Ser. No. 599,051, Jul. 25, 1975. Continuation of Ser. No. 877,564, Feb. 13, 1978, now Re. 30,487. Application for reissue Jun. 27, 1979, Ser. No. 52,666

Int. Cl.³ B60S *9/02*

U.S. Cl. 280—763 **1 Claim**



5. In a trailer landing gear assembly having a tubular housing, means for securing said housing to said trailer, a landing gear foot adapted to engage the ground, and an extension assembly having a downwardly depending axle adapted to be received in two registering apertures in said foot, the improvement comprising vertical load supporting means comprising a pair of spaced apart wall members, each wall member comprising a substantially vertical central portion disposed parallel to the opposing central portion, and including one of said two registering apertures and a substantially vertical end portion aligned at each end of each central portion so as to intersect the plane of said central portion and secured to the end of said central portion to thereby provide lateral support to said central portion, and each said wall member further comprising a cylindrical portion integral and of unitary construction therewith formed by deforming a portion of said wall member around the periphery of its registering aperture to extend coaxially from one side of its registering aperture and further comprising a transversely extending support wall integrally connected at its ends to said pair of spaced apart wall members, said support wall being positioned below said apertures and running parallel to the axis of said aligned apertures.

Re. 31,012

FITMENT FOR A VESSEL

John D. Allen, 5005 Zahm Rd., Belding, Mich. 48809

Original No. 4,236,735, dated Dec. 2, 1980, Ser. No. 901,416, May 1, 1978. Application for reissue May 14, 1981, Ser. No. 263,490

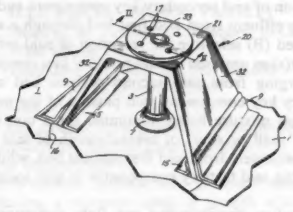
Int. Cl.³ F16L *13/04*

U.S. Cl. 285—114 **15 Claims**

14. A fitment for a vessel wall, said fitment comprising:

a top wall for receiving a flange of a hose or the like to be coupled to the vessel wall, said top wall having a pair of generally opposing rectilinear sides, said top wall having a pipe opening;

a pair of generally planar, trapezoidally shaped support legs extending downwardly from said generally opposing sides to form an obtuse angle between said top wall and each of said legs and supporting said top wall at a position spaced from the vessel wall, the area between said legs being readily accessible and laterally bounded by substantially only said legs thereby facilitating connection of said support legs to the vessel wall and facilitating cleaning of the vessel wall and said fitment in the area between said legs; and



a pipe means for carrying a substance from said pipe opening to the vessel wall and into the interior of the vessel, said pipe means being attached to said top wall at said pipe opening.

Re. 31,013

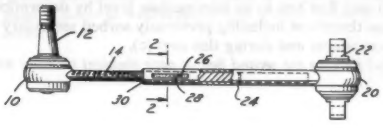
CALIBRATED REPLACEMENT TORQUE ROD

Joseph E. Smith, Jr., Birmingham, Mich., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Original No. 4,146,340, dated Mar. 27, 1979, Ser. No. 848,944, Nov. 7, 1977. Application for reissue May 19, 1980, Ser. No. 151,479

Int. Cl.³ B62D *7/16*

U.S. Cl. 403—27 **4 Claims**



4. A vehicle rod replacement assembly consisting of

(a) a pair of movable joint assemblies;

(b) a single tube permanently secured to and extending from one of said joint assemblies, said tube having an open end and an axial bore of constant diameter from end to end;

(c) a single rod permanently secured to and extending from the other of said joint assemblies, said rod having in assembly a portion introduced in said tube through said tube open end disposed in freely slidable unrestrained fit within the axial bore of said tube;

(d) at least one aperture through a wall of said tube, said aperture being disposed proximate the open end of said tube; and

(e) a puddle weld in said aperture welding said tube to said rod and a single encircling weld between the open end of said tube and a corresponding peripheral surface area of said rod.

Re. 31,014

SEPARATION OF MULTICOMPONENT GAS MIXTURES

Shivaji Sircar, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Original No. 4,171,206, dated Oct. 16, 1979, Ser. No. 935,435, Aug. 21, 1978. Application for reissue Mar. 30, 1981, Ser. No. 248,774

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—26 **27 Claims**

1. In the separation of a multicomponent feed gas mixture with the individual recovery of a primary key component and

a secondary key component present in such mixture, by selective sorption, wherein said secondary key component is more strongly sorbed than the primary key component and there is present in said mixture at least one minor dilute tertiary gas component less strongly sorbed than the secondary key component; the method which comprises, in an adiabatic adsorption pressure swing cycle the steps of:

(a) passing such multicomponent gas mixture at initial superatmospheric pressure and in selected flow direction through a first sorbent bed (A) selective for preferential retention of said secondary key component and then passing the effluent from said first bed through a second sorbent bed (B) selective for retention of said tertiary component(s) as opposed to said primary key component, and discharging from said second sorbent bed unadsorbed primary key component, said passing of the multicomponent gas mixture being continued for a controlled time period until or short of breakthrough of said secondary key component from said first sorbent bed, while retaining all of the said tertiary components in said second sorbent bed;

(b) thereafter discontinuing gas flow communication between said first and second sorbent beds, and

(i) rinsing said first bed by flowing a stream of relatively pure secondary key component therethrough at substantially the initial feed pressure level for a controlled time period effective to purge most of the void and displaced gases from the said first bed, and during this time period (b),

(ii) lowering the pressure in said second bed to an intermediate level by withdrawing a gas stream therefrom including void and desorbed gases, and thereafter;

(iii) further depressuring said second bed to near ambient pressure [followed by;]

[(iv) purging the second bed at near ambient pressure with a stream of primary key component];

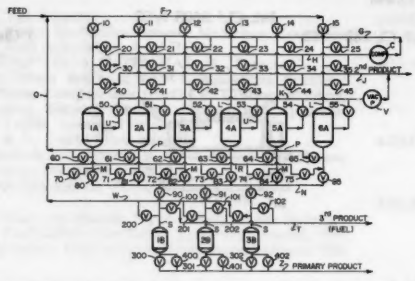
(c) after said rinsing step in (b) above reducing the pressure in said first bed to an intermediate level by desorption of gas therefrom including previously sorbed secondary key component and during this step (c),

(iv) purging the second bed at near ambient pressure with a stream of primary key component and repressuring the second bed to an [immediate] *intermediate* pressure level by flow thereinto of gas essentially free of the secondary key component;

(d) following step (c) above further desorbing gas from said first bed to lower the pressure therein to substantially ambient level, and thereafter;

(e) evacuating said first bed to subatmospheric level;

(f) after attaining the subatmospheric level in the said first bed, introducing thereinto a gas stream substantially free



of the secondary key component to bring said first bed to an intermediate pressure level, and thereafter;

(g) further repressurizing said first bed to initial superatmospheric feed pressure level by flowing thereinto primary key product gas via a second bed already pressurized to the intermediate pressure level (step c), thereby bringing both beds to the feed pressure level and making them ready to repeat the defined sequence of steps beginning with the reintroduction of the multicomponent feed gas mixture into the said first sorbent bed.

PLANT PATENTS

GRANTED AUGUST 17, 1982

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,876

ROSE PLANT

Fred A. Mungia, Sr., P.O. Box 338, McFarland, Calif. 93250

Filed Dec. 8, 1980, Ser. No. 213,910

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—6 **1 Claim**

1. A new and distinct variety of rose plant of the climbing hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by its general similarity to its parent variety, "Dame de Coeur", but different therefrom by its pronounced climbing growth habit.

4,877

ALMOND TREE

Fred B. Urline, 2058 Fay Dr., Atwater, Calif. 95301, assignor to Fred B. Urline and Adele Urline, both of Atwater, Calif.

Filed Dec. 5, 1980, Ser. No. 213,738

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—30 **1 Claim**

1. A new and distinct variety of almond tree, substantially as illustrated and described, particularly characterized by heart-shaped, non-gummy nuts having sweet-flavored kernels; and by blooming with the Nonpareil and Merced, and harvesting with the Merced.

4,878

ILEX PLANT—MESOG VARIETY

Kathleen K. Meserve, St. James, N.Y., assignor to Conard-Pyle Company, West Grove, Pa.

Filed Jun. 26, 1980, Ser. No. 163,069

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—65 **1 Claim**

1. A new and distinct variety of Ilex, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of:

(a) a well-branched, symmetrical, compact, medium-sized shrub having a vigorous habit of growth which is well-adapted to a wide range of landscape uses,

(b) a profusion of dull, scarlet fruit which is produced in spring and which attains its full scarlet coloration in mid to late fall, lasting on the bush into spring of the following year,

(c) the ability to be sheared and trimmed to be kept within prescribed limits or shaped to a particular form,

(d) cold tolerance which is superior to the species *Ilex cornuta* as well as most cultivars of that species, as evidenced by the fact that the present variety has survived with no visible damage temperatures of −15° F., whereas the species *Ilex cornuta* and most of its cultivars are listed as hardy to 0° F.,

(e) good heat tolerance which is characteristic of *Ilex cornuta* and which is much improved over *Ilex rugosa,* and,

(f) green, semi-glossy to glossy foliage which is less quadrangular in shape as well as less glossy in appearance than *Ilex cornuta.*

PATENTS

GRANTED AUG. 17, 1982

ERRATA

For CLASS	See PATENT NO.
464–085	4,344,304
464–169	4,344,305
464–034	4,344,306
374–044	4,344,315
089–001	4,344,592
524–159	4,344,767
528–058	4,344,873
524–296	4,344,874
424–078	4,344,875
524–091	4,344,876
524–102	4,344,877
524–409	4,344,878
549–229	4,344,881
549–387	4,344,882
549–467	4,344,883
549–273	4,344,884
549–291	4,344,885
549–408	4,344,886
549–531	4,344,887
373–027	4,345,106
378–019	4,345,157
378–005	4,345,158

PATENTS

GRANTED AUG. 17, 1971

INDEX

PATENTS

GRANTED AUGUST 17, 1982

GENERAL AND MECHANICAL

4,344,189

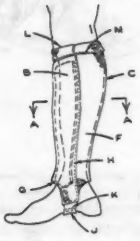
LIMB PROTECTOR FOR ATHLETES

Albert L. Futere, 4901-17th Ave. South, and Michael J. Kelly, 808 NE. 82nd, both of Seattle, Wash. 98108

Continuation-in-part of Ser. No. 850,712, Nov. 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 757,246, Jan. 6, 1977, abandoned, which is a continuation-in-part of Ser. No. 552,551, Feb. 24, 1975, Pat. No. 4,001,953, which is a continuation-in-part of Ser. No. 461,156, Apr. 15, 1974, abandoned. This application Nov. 6, 1978, Ser. No. 957,992

Int. Cl.[2] A41D *13/08, 17/00*

U.S. Cl. 2—16 **5 Claims**



1. An arm guard, comprising:

a generally cylindrical sleeve-like element which is tapered from one end to the other and otherwise configured to substantially conform to the shape of a human forearm, wherein said sleeve has first and second closed pockets defined therein which extend substantially from said one end thereof to said other end, each pocket extending around approximately one-half of the circumference of said sleeve-like element; and

first and second protective pads enclosed in said first and second pockets, wherein said protective pads are tapered from one end thereof to the other end and extend substantially the length of said sleeve-like element, each protective pad extending around approximately one-half of the circumference of the user's forearm, and wherein said protective pads are sufficiently flexible that they conform substantially to the circumferential outline of the user's forearm, and wherein said sleeve-like element, when stretched to fit over the user's forearm, is sufficiently elastic that said sleeve-like element and said protective pad are held in place on the user's arm even during violent movement thereof, including contact with another object.

4,344,190

PLUGS FOR THE MEDULLARY CANAL OF A BONE

Alan J. C. Lee, and Robin S. M. Ling, both of Exeter, England, assignors to University of Exeter, Devon, England

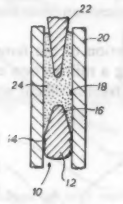
Filed Jul. 23, 1980, Ser. No. 171,309

Claims priority, application United Kingdom, Jul. 25, 1979, 7925892

Int. Cl.[3] A61F *1/00, 1/24*

U.S. Cl. 3—1.9 **14 Claims**

1. A plug for the medullary canal of a bone, said plug being adapted to be a push fit in a medullary canal and comprising a first elongate portion having elongate sides and a second elongate portion extending from one end of said first portion and tapering gradually inwardly along its length in the direction away from said first portion, said plug being adapted to be push fit into a medullary canal of a bone with said first portion leading such that said second portion extends into the portion of the canal into which bone cement can be introduced for locating an implant in the medullary canal whereby, when bone cement is introduced into the canal, the gradually tapering portion of said plug forms a mould so that there is a gradually increasing thickness in cement in contact with the bore along the length of the tapering portion in the direction away from said first elongate portion.



4,344,191

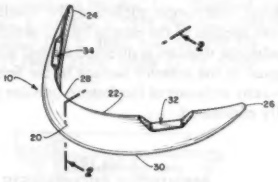
CHIN IMPLANT

Kurt J. Wagner, 14050 Valley Vista Blvd., Sherman Oaks, Calif. 91423

Filed Jan. 15, 1981, Ser. No. 225,216

Int. Cl.[3] A61F *1/24*

U.S. Cl. 3—1.9 **5 Claims**



1. A chin implant for cosmetic surgery in a human mandible which comprises:

a solid, crescent-shaped implant having a front face and a back face, each said face tapering bilaterally to form respective tails of the implant, and each face merging to form an upper edge and a lower edge;

said back face having a flat surface for placement adjacent to the mental protuberance of the mandible;

said front face having a curved projection surface for protruding from the chin to create a natural chin profile after implanting; and

said upper edge having a pair of notches placed laterally thereon and adjacent to each mental foramen of said mandible for allowing a space between said implant and mental nerves.

4,344,192

FULL DUAL ELEMENT PROSTHESIS DESIGNED FOR THE FEMORO-PATELLAR JOINT

Jean C. Imbert, Les Flaches, Route de St Heand, 42580 l'Etrat, France

Filed Jul. 14, 1980, Ser. No. 168,137

Int. Cl.[3] A61F *1/24*

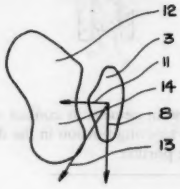
U.S. Cl. 3—1.91 **6 Claims**

1. In combination with a prosthetic implant for a knee joint wherein a patellar component has an anterior surface adapted to be secured within a resection in the patella, a posterior surface having a convex portion defining a central axis, a

femoral trochlear component having a posterior portion adapted to be secured within a resection of the femur, the improvement comprising:

a frusto-conical sector portion mounted opposite said posterior portion of the femoral trochlear component, said frusto-conical sector portion having an outer surface adapted to communicate with said convex portion of the patellar component defining the anterior surface of the femoral component, an inner surface and a pair of parallel side edges;

said posterior portion of the femoral trochlear component further defining a rail portion extending along said inner surface of the frusto-conical sector portion; a narrowed



body portion contiguous said rail portion and means for securing said frusto-conical sector portion within a resection of the femur;

said femoral trochlear component further being sized and shaped for mounting to one bank of the trochlear of the femur a predetermined offset distance from said central axis of the convex portion of the posterior surface of the patellar component such that the resultant force of the forces applied to the patella by the patellar tendo and the quadriceps muscles is directed against and is substantially normal to the anterior surface of the femoral component whereby arthrosis of the femoro-patellar joint are substantially eliminated.

4,344,193

MENISCUS PROSTHESIS

Charles H. Kenny, 276 South St., Pittsfield, Mass. 01201

Filed Nov. 28, 1980, Ser. No. 211,292
Int. Cl.³ A61F 1/24
U.S. Cl. 3—1.911 **17 Claims**

1. A meniscus prosthetic device to prevent and reverse degenerative changes in a human knee comprising:

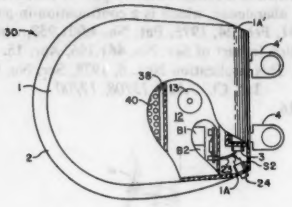
means for replacing natural components of a condylar joint so that the articular cartilage therein remains intact, and comprising a body including means for encouraging rotary and anterior-posterior translation of said prosthetic device when in direct communication with the condyle joint of a human knee during motion; and means for providing elastic deformation of said body to conform to changing condylar profiles of a human knee during motion.

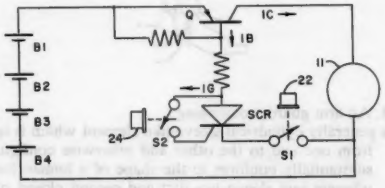
4,344,194

TOILET SEAT AND LID UNIT WITH CONCEALED AIR DEODORIZER

Raymond H. Pearson, 627 Sherwood Dr., Richardson, Tex. 75080

Filed Dec. 12, 1980, Ser. No. 215,801
Int. Cl.³ E03D 9/04
U.S. Cl. 4—213 **6 Claims**





1. A toilet seat and air deodorizing unit for an upwardly opening water closet bowl, comprising a toilet seat adapted to be positioned on said bowl and pivotally mounted about a horizontal axis at the rear of said bowl for swinging movement between raised and lowered positions, a toilet seat lid pivotally mounted independently of said seat for swinging movement about a horizontal axis at the rear of said bowl, enabling said lid to be swung between a lowered position where it covers the central opening in said seat and a raised position where it is raised from the seat, said seat being formed with at least one air passage having an open air intake end located to open into and to be in air communication with the interior of said bowl, said lid having a hollow, interior, air chamber space and at least one air discharge vent opening into said interior space and establishing air communication between said interior space and the ambient atmosphere exteriorly of said lid and said bowl, there being means establishing air communication between said interior space and said air passage remote from said air intake end for establishing air communication between the interior of said bowl and the ambient atmosphere by way of said air passage, said interior space and said vent in seriatim, a motor-driven fan mounted in said space between said means and said vent for inducing the flow of air from said bowl to the ambient atmosphere by way of said air passage, said means, said interior space and said vent in seriatim, and an air-deodorizing filter mounted in said interior space in seriatim with said fan for removing odors from the air induced from said bowl by said fan and to thereby provide for the discharge of deodorized air through said vent to the ambient atmosphere outside said bowl and said lid, said means comprising at least one hollow, horizontally mounted pintle on which said lid and said seat are pivotally mounted for swinging movement between their raised and lowered positions, said pintle being open to said air passage and to said interior space to establish air communication between said air passage and said space.

4,344,195

BED HAVING TWO MUTUALLY DISPLACEABLE FRAMES FOR WALL SIDE ACCESS

Hans H. Gustafson, Trädgardsgatan 22, S-172 38 Sundbyberg, Sweden

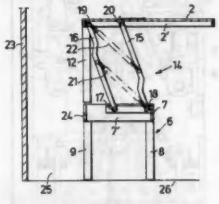
PCT No. PCT/SE79/00044, § 371 Date Nov. 2, 1979, § 102(e) Date Sep. 4, 1979, PCT Pub. No. WO79/00689, PCT Pub. Date Sep. 20, 1979

PCT Filed Mar. 1, 1979, Ser. No. 186,022

Claims priority, application Sweden, Mar. 2, 1978, 7802353

Int. Cl.³ A47C *19/04*

U.S. Cl. 5—11 **5 Claims**



1. A bed having a first, upper frame structure (5, 12,12'; 27,28, 32,33,34,35) including a rectangular mattress or bedding support surface (2) whose length is greater than its width; a second, lower frame structure (6; 36) adapted to be mounted on a floor (26); and at least one pivot-arm mechanism (14; 37) disposed between said first and second frame structures and connected to pivot locations (17–20; 41,43,49,51) mounted on respective ones of said frame structures, said pivot-arm mechanism being swingable between a first, downward position and a second, upward position, said pivot-arm mechanism altering, during said swinging movements, the vertical distance between the two frame structures and simultaneously displacing the first frame structure laterally relative to the second frame structure, characterized by: the rectangular support surface having an outer contour exceeding that of said second frame support, the outer contour of said second frame structure in the downward position of the first frame structure lying within the outer contour of the first frame structure, the pivot-arm mechanism being configured to lift and laterally displace the first frame structure, when swung upwardly, at least in the width direction of the support surface to a raised position in which the outer contour of the second frame structure still does not extend horizontally outwardly beyond the outer contour of the lifted and displaced support surface, to thereby form, when the support surface has a long side adjacent a wall, a space between the wall and the bed which permits easy access and passage by an attendant.

4,344,196

FITTED TOP CONTOUR SHEET

Helen F. Large, 25 A Center St., Rumson, N.J. 07760

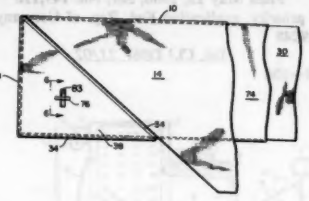
Continuation-in-part of Ser. No. 94,326, Nov. 14, 1979, Pat. No. 4,245,365. This application Sep. 26, 1980, Ser. No. 190,961

The portion of the term of this patent subsequent to Jan. 20, 1998, has been disclaimed.

Int. Cl.³ A47G *9/02, 9/04*

U.S. Cl. 5—496 **7 Claims**

1. A fitted contour top sheet for use on a mattress comprising: a top panel having a front, a rear, and length and width dimensions approximately the same as the mattress with which the sheet is used, said top panel having opposed, rear corners; side panels along opposed sides of said top panel and terminating at the respective said corners, each said side panel having rear edges angled at about 45° from said rear corner, forwardly to an outboard edge of said side panel; a pocket formed at the rear of said top panel comprising a vertical panel joined to said top panel, interconnecting said top panel rear corners, and having a height approximately the same as the thickness of the mattress with which the sheet is used, said vertical panel having a width generally equal the width of said top panel, a horizontal bottom panel having a width dimension generally the same as that of said vertical panel and having a rear elongate edge joined to said vertical panel at a lower, rear edge thereof, a pair of side, generally triangular gusset members



joined to adjacent side edges of said vertical and horizontal bottom members to thereby form a pocket which is fitted over the foot and a part of the bottom of the mattress with which the sheet is used; and means on said pair of gusset members cooperating with means attachable to the mattress for releasably attaching said top sheet to the mattress.

4,344,197

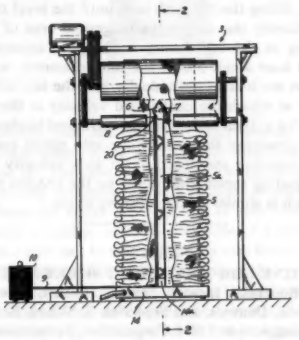
METHOD TO LESSEN THE ENTANGLEMENT OF TUBULAR FABRICS

Larry D. Sterling, and Wilbert Melvin, Jr., both of Dover, Del., assignors to International Playtex, Inc., Stamford, Conn.

Division of Ser. No. 8,986, Feb. 5, 1979, Pat. No. 4,288,999. This application Jun. 4, 1981, Ser. No. 270,325

Int. Cl.³ D06B *23/00*; B65B *11/58, 67/08*

U.S. Cl. 8—150 **5 Claims**



1. A method for lessening the entanglement of tubular fabrics during processing of, including the steps of:

positioning a flexible length of hooping material having two ends, along an axis;

delivering a tubular extent of fabric along said axis of said hooping material so that said ends of said hooping material extend beyond said ends of said tubular extent of fabric;

collapsing said tubular extent of fabric along said axis of said hooping material so that said ends of said hooping material extend beyond said ends of said tubular extent of fabric;

securing said ends of said hooping material to each other to form an endless hoop about said collapsed tubular extent of fabric; and

processing said collapsed tubular extent of fabric with said hoop in place.

4,344,198

PROCEDURE FOR WASHING CLOTHES

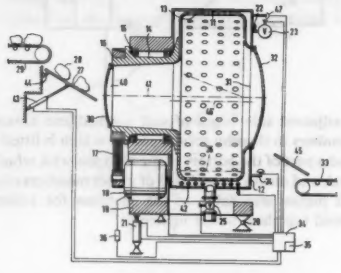
Hans F. Arendt, Sersheim, and Ernst H. Hoffmann, Dortmund, both of Fed. Rep. of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed May 12, 1980, Ser. No. 149,116

Claims priority, application Fed. Rep. of Germany, May 12, 1979, 2919248

Int. Cl.³ D06F *23/02*

U.S. Cl. 8—158 **19 Claims**



1. A process for the washing of clothes through a wash and rinse cycle in a washing machine with a horizontal, perforated, driven tub arranged inside a housing, wherein the tub has at its rotating periphery a tangential area, in which during the washing and rinsing cycles as the tub rotates, the clothes are repeatedly lifted up and then fall in a trajectory path onto the lower portion of the tub and are then distributed without unbalance to the tub, as the tub velocity is gradually increased, and are then centrifuged as the velocity is increased further, the improvement comprising the steps of wetting the clothes with an amount of suds that gives a "doughy" consistency to the clothes by filling the tub with suds until the level of suds does not significantly rise above the tangential area of the tub by maintaining in the tub during washing an aqueous medium level of at least about 5% of the tub's diameter, whereby the dry clothes are loaded individually into the tub which rotates at a speed at which the centrifugal velocity at the tub case is about 0.3–0.8 g, then increasing the tub speed to about 1 g, then gradually changing the speed to a spin speed and after the spinning, reducing the speed again to a velocity in keeping with the loading speed, and following the process with a rinse cycle which is similar to the washing cycle.

4,344,199

MACHINE FOR STIFFENING SHEET MATERIAL

George J. Bouzianis, Ipswich; John G. Hollick, Beverly; Donald B. McIlvin, Danvers, and Frederick S. Sillars, Beverly, all of Mass., assignors to USM Corporation, Farmington, Conn.

Filed Jun. 26, 1980, Ser. No. 163,220

Int. Cl.³ A43D *11/00*; B05B *7/06*; B28B *3/00*

U.S. Cl. 12—54.3 **29 Claims**

24. In combination with complimentary shaped male and female molds, said female mold having a generally V-shaped internal construction, said molds being arranged to shape, stiffen and laminate selected portions of flexible sheets of material, the improvement which comprises:

means to dispose at least one of said sheets within said female mold and means to tension one of said sheets while said sheet is disposed within said female mold; and

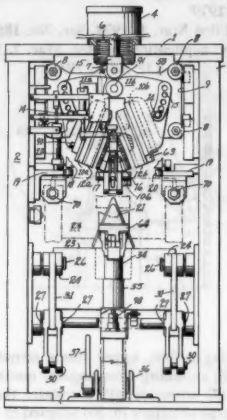
means to soften a resin into a flowable state; and

a reciprocable extruder with a nozzle disposed on the end thereof and arranged to enter said female mold and deposit a quantity of said resin upon portions of the tensioned sheet; and

means connecting said extruder to said softening means; and

means to pivot said nozzle around said extruder; and

means disposed on the extruder to urge one side of the untensioned sheet and move it from the path of the extruder during an entry stroke and means on said extruder to draw the other side of the untensioned sheet and replace the untensioned sheet adjacent to the tensioned sheet during the withdrawal stroke of the extruder; and



means connecting said extruder to said softening means; and

means to pivot said applicator around said extruder during the withdrawal stroke of said applicator.

4,344,200

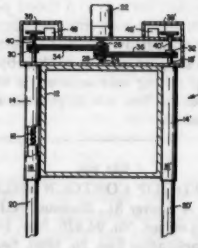
BRIDGE BRAKE SYSTEM

Aaron V. Farr, Logan, and Robert L. Saunders, Ogden, both of Utah, assignors to Abex Corporation, New York, N.Y.

Filed Sep. 25, 1980, Ser. No. 190,685

Int. Cl.³ E01D *1/00*

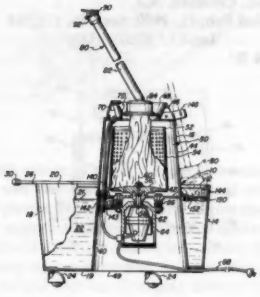
U.S. Cl. 14—71.5 **3 Claims**



1. A passenger loading bridge having a movable end comprising: means connected to the bridge for driving the movable end; brake means mounted adjacent the driving means for engaging and locking the driving means when actuated, means mounted on the bridge for sensing the rate of movement of the driving means; first means mounted adjacent the driving means for producing a signal at a rate proportional to the rate of movement of the driving means characterized by: second means mounted on the bridge for producing a signal during a preset time window; comparator means operatively connected to the first and second signal producing means for determining whether the signal from the first signal producing means occurs during the time a signal is produced by the second signal producing means and means operatively connected to the drive means for interrupting said driving means and actuating

the brake means to engage and lock the driving means when the signal from the first signal producing means occurs outside of the time the signal is produced by the second signal producing means.

4,344,201
CLEANING APPARATUS
George S. Trisolini, Via Donatello 5, Palagino, Italy
Filed Dec. 3, 1980, Ser. No. 212,634
Int. Cl.³ B08B *11/02*
U.S. Cl. 15—3 **11 Claims**

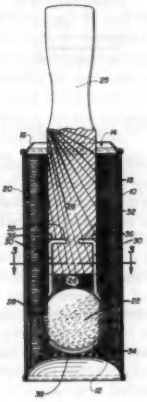


1. Cleaning apparatus comprising:
a mop having
a handle; and
a wiper mounted on the handle for rotation relative thereto; and
a mop wringer for extracting from the wiper of the mop matter carried by the wiper, the mop wringer having
a housing;
an opening in the housing for passing at least a portion of the wiper of the mop therethrough;
a basket within the housing and juxtaposed with the opening for receiving said portion of the wiper of the mop, the basket having an axially-extending perforated wall;
means mounting the basket for rotation in the housing about an axis extending in the same general direction as the axially-extending perforated wall of the basket; and
a motor coupled with the basket for rotating the basket and, consequently, the wiper of the mop when said portion of the wiper is in the basket, about said axis such that the wiper is forced against the perforated wall of the basket and matter in the wiper is extracted therefrom through the perforated wall of the basket.

4,344,202
ELECTRIC TOOTHBRUSH
Victor Hayat, 169 Bd Malesherbes, 75017 Paris, France
Filed Feb. 6, 1980, Ser. No. 119,011
Claims priority, application France, Feb. 22, 1979, 79 04512
Int. Cl.³ A46B *13/02*
U.S. Cl. 15—4 **4 Claims**

1. An electric toothbrush comprising a rotatable brush, a shaft mounting said brush, means for rotating said brush continuously about its longitudinal axis, means for conferring a reciprocal movement to said brush, and a tip mounted at the end of the shaft of said brush, said tip being conical in shape with a sharply pointed apex and an apex angle sized to permit said tip to be introduced into and through the interdental space for massaging the papilla and cleaning the mesial and distal faces of the teeth.

4,344,203
PORTABLE GOLF BALL WASHER
Richard L. Gerrick, 125 Woodland View, York, Pa. 17402
Filed Feb. 2, 1981, Ser. No. 230,878
Int. Cl.³ A63B *47/04*
U.S. Cl. 15—21 A **2 Claims**



1. A portable golf ball washer comprising an elongated cylindrical container closed at one end comprising a bottom and open at the opposite end normally comprising the top, scrubbing bristles extending a predetermined uniform distance inwardly from the entire inner surface of said container, the tips of which in repose define a core hole of a diameter less than that of a golf ball to be scrubbed by said bristles, an elongated plunger having a length greater than that of said container and a cross-sectional area similar to that of said core hole and a transverse dimension less than the diameter of a golf ball, one end of said plunger being a handle projecting beyond the open end of said container when said plunger is inserted to maximum extent therein and is manually engageable for operation of the washer, and the opposite end of said plunger having a U-shaped bail-like ball-retaining member substantially circular for more than 180° of the circumference thereof and dimensioned to closely but loosely surround a golf ball to effect movement thereof relative to said bristles when said plunger is reciprocated axially, and the legs of said bail-like member being parallel and fixed to said opposite end of said plunger within grooves formed longitudinally in the opposite sides thereof to maintain said member in axial alignment with said plunger and the diameter of the portion of said bail-like member which is circular having a diameter greater than the transverse dimension of said opposite end of said plunger to effect efficient exposure to the surface of a ball within said member to the bristles within said container.

4,344,204

APPARATUS FOR CLEANING DOOR FRAMES OF COKE OVENS

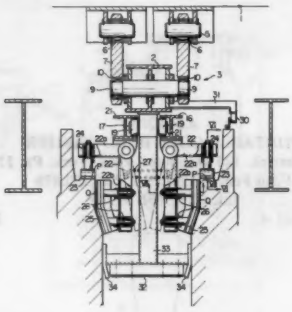
Kenji Fujita; Kazuo Korehisa; Hirosi Asaba; Hideo Harada, all of Yokosuka, and Tsuneo Shibuya, Yokohama, all of Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Sep. 5, 1980, Ser. No. 184,307

Claims priority, application Japan, Sep. 7, 1979, 54-114884

Int. Cl.³ C10B *43/04*

U.S. Cl. 15—93 A **5 Claims**



1. An apparatus for cleaning door frames of a coke oven comprising:

a main frame movable toward or away from a door frame;

a supporting frame so disposed in front of said main frame that said supporting frame is movable laterally relative to said main frame in parallel therewith;

a movable frame so disposed in front of said supporting frame that said movable frame is vertically reciprocable relative to said supporting frame;

at least one pair of L-shaped levers horizontally pivotably mounted on said movable frame, the pivotal points of said L-shaped levers being horizontally laterally spaced apart from each other by a suitable distance, each L-shaped lever having a forwardly extended arm and a laterally outwardly extended arm;

a front surface scraper mounted on said laterally outwardly extended arm;

an inner surface scraper mounted on said forwardly extended arm; and

a bias means so loaded that said forwardly extended arms of said pair of L-shaped levers are normally moved toward each other.

4,344,205

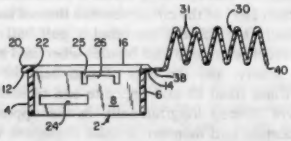
CABLE BUSHING

Richard M. Latino, Worcester, and Edmund T. Paquette, Shrewsbury, both of Mass., assignors to Wright Line Inc., Worcester, Mass.

Filed Apr. 11, 1980, Ser. No. 139,286

Int. Cl.³ F16L *5/00*

U.S. Cl. 16—2 **11 Claims**



1. A cable bushing comprising a frame portion, and a filler portion connected to said frame portion, said filler portion being pivotally movable between a first position in which said filler portion is remote from the interior of said frame portion and a second position in which said filler portion is disposed substantially within said frame portion, said frame portion being adapted to occupy an opening in a partition structure and being further adapted to receive a cable therethrough, said filler portion while in said second position being extendable to substantially close said frame portion, and being compressible so as to form an opening between it and the frame portion so as to permit the cable to be received therethrough.

4,344,206

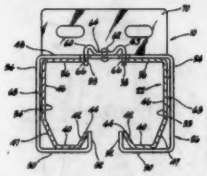
BRACKET AND DOOR TRACK ASSEMBLY

Lars Hermanson, Scarborough, Canada, assignor to Clark Door Company, Inc., Cranford, N.J.

Filed Feb. 21, 1980, Ser. No. 123,262

Int. Cl.³ E05D *15/06*

U.S. Cl. 16—94 R **6 Claims**



1. A bracket and track assembly comprising:

(a) a track including at least one track member, said track member including:

1. a transverse upper portion having a longitudinal margin portion,
2. a transverse lower portion, and
3. a web portion interconnecting said upper and lower portions of the track member,

(b) a bracket member disposed in embracing relation about said track member and including:

1. a transverse upper portion extending beyond said track upper portion longitudinal margin portion,
2. a transverse lower portion supporting said track member lower portion,
3. at least one web portion interconnecting said upper and lower portions of the bracket member, and
4. locking means rotatably mounted to said upper portion of the bracket member, said locking means including engagement means rotatable into lateral engagement with said track upper portion longitudinal margin portion and tending to urge said track member into engagement with said bracket member,

(c) said track member web portion being spaced from said bracket member web portion, and

(d) at least one pad being disposed between said web portions of the track member and bracket member intermediate said upper and lower portions of the track member and bracket member tending to move said track lower portion laterally in one direction into engagement with said bracket lower portion when said track upper portion is moved laterally in the opposite direction upon lateral engagement of the locking engagement means with the longitudinal margin portion of the track upper portion.

4,344,207

APPARATUS FOR ALIGNING FISH

Harald Rosenberg, Lübeck, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud. Baader GmbH & Co. KG, Lübeck, Fed. Rep. of Germany

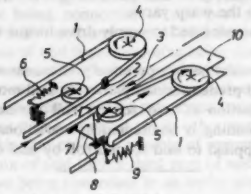
Filed Mar. 13, 1981, Ser. No. 243,378

Int. Cl.³ A22C *25/08, 25/14*

U.S. Cl. 17—63 **8 Claims**

1. Apparatus for aligning fish, said fish having a head end, a tail end, flanks, a rump portion intermediate said head end and

said tail end and a longitudinal axis extending between said head end and said tail end, said apparatus including two first conveying means, said two first conveying means being adapted to engage said flanks of said fish and thereby to convey said fish in a conveying direction essentially transverse to said longitudinal axis with said longitudinal axis of said fish extending substantially vertically and said tail end lowermost, said apparatus further including a pivotable flap, and a biasing means connected to said pivotable flap, said flap being positioned below said first conveying means and extending upwards to point where, in use, it is engaged by said rump portion of said fish, said flap being pivotable in said conveying direction about a pivotal axis extending transverse to said conveying direction by engagement of said flap with said rump portion of said fish against a force exerted by said biasing means, said two first conveying means extending substantially parallel to one another up to said flap but diverging downstream of said flap in said conveying direction, resilient support means being associated with the divergent portions of said two first conveying means.



4,344,208

NEEDLE PLATE FOR NEEDLE BARS OF NEEDLE BAR DRAWING DEVICES

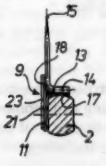
Helmut Kunig, Lübeck, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud. Baader GmbH & Co. KG, Lübeck, Fed. Rep. of Germany

Filed Jul. 22, 1980, Ser. No. 171,190

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1979, 2934431

Int. Cl.³ D01G *19/00, 5/14*

U.S. Cl. 19—129 R **9 Claims**



1. Needle rod for mounting on needle bars of needle bar drawing devices, said needle rod including a carrier rod, said carrier rod having a first surface and a second surface, said second surface extending substantially perpendicular to said first surface, and at least one row of needles, said needles each having a shaft, a free end and a tip, said shaft comprising a first portion terminating in said free end and a second portion terminating in said tip, said first portion extending substantially perpendicular to said second portion whereby said shaft includes a substantially right angle bend, at least a part of the length of each of said first and second portions of said shafts being connected to a respective one of said first and second surfaces of said carrier rod, said carrier rod being formed with a middle web and two side webs, the first and second surfaces of said carrier rod being afforded by said middle web and one of said side webs, the other of said two side webs constituting a limb for securing said needle rod to said needle bars.

4,344,209

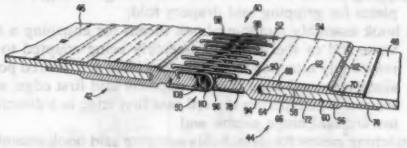
IN-LINE CLIPPER SEAM

William J. Harwood, Waycross, Ga., assignor to Scapa Dryers, Inc., Waycross, Ga.

Filed Oct. 22, 1979, Ser. No. 86,792

Int. Cl.³ F16G *3/02*

U.S. Cl. 24—31 R **13 Claims**



1. A clipper seam for use with a pintle in joining adjacent ends of a papermakers belt or the like, said seam comprising:

(A) a plurality of machine direction and cross-machine direction yarns interwoven to form a one-piece seam webbing including

(a) first and second flaps, each of said flaps having an inner surface and an outer surface, wherein the outer surfaces of said flaps each taper in a stepped relationship in a direction away from said tongue to said one of said ends of said papermakers belt, said inner surfaces being in a spaced relationship to define a pocket adapted to receive one of said ends of said papermakers belt,

(b) a tongue portion, said flaps being integral with said tongue portion in said spaced relationship, said tongue portion defining a top surface which is coplanar with a portion of the outer surface of said first flap and a bottom surface which is coplanar with a portion of the outer surface of said second flap,

(c) a first recessed margin on the top surface of said tongue, and

(d) a second recessed margin on the bottom surface of said tongue; and

(B) a plurality of clipper hooks secured to said tongue within said first and second recessed margins, said hooks being adapted to receive a pintle.

4,344,210

ADJUSTABLE DRAPERY SUPPORT ASSEMBLY

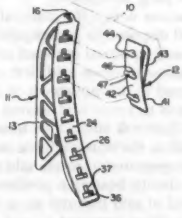
Richard B. Ryan, 1205 Deertrail La., Libertyville, Ill. 60048

Continuation-in-part of Ser. No. 73,668, Sep. 10, 1979, Pat. No. 4,261,080. This application Jul. 28, 1980, Ser. No. 172,835

Claims priority, application Fed. Rep. of Germany,

Int. Cl.³ A44B *13/00*

U.S. Cl. 24—369 **6 Claims**



1. An adjustable support assembly for a drapery or the like comprising:

a first elongated plate member adapted to be inserted into a fold of a drapery;

a second elongated plate member having a first edge substantially aligned with an edge of said first plate member;

hinge means interconnecting an upper end of both said first and second plate members;

interlocking means on said first and second plate members, said interlocking means being spaced from said hinge means and adapted to interlock said plates, said means including prong means affixed to one of said plates adapted to penetrate said drapery fold positioned between said plates and latch means affixed to the other of said plates;

gripping means on at least one of said aligned edges of said plates for gripping said drapery fold;

a hook assembly including hook means for engaging a traverse rod or the like, said assembly being adapted to be removably attached to said second plate at a desired point along a second edge thereof opposite said first edge, said second edge tapering toward said first edge in a direction toward said hinge means; and

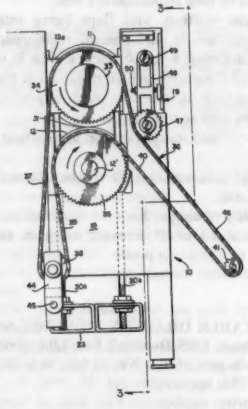
attaching means for detachably securing said hook assembly to said second plate.

4,344,211

HIGH PRESSURE SIZING APPARATUS AND METHOD

Charlie R. Christian, Lafayette; Jack C. Gaskins, Lanett, both of Ala.; Jack Hamrick, West Point, Ga., and Norman L. Reed, Lanett, Ala., assignors to West Point Foundry & Machine Co., West Point, Ga.

Filed Jun. 23, 1980, Ser. No. 161,702
Int. Cl.³ D06B *3/04, 15/02*
U.S. Cl. 28—183 **16 Claims**



1. Apparatus for squeezing a slippery wet material web to remove at least some of the liquid from the material as the web moves along a path, comprising:

a first roll across which the material web passes;

a second roll disposed to press against the first roll with the material web squeezed between said two rolles;

means operative to drive said first roll at a predetermined speed related to the movement of the web along the path, so as to tend to rotate said second roll by surface contact with the first roll subject to increasing slippage of the second roll as the squeeze force increases;

drive means operative to rotate said second roll at a certain angular velocity bearing a predetermined relation to the drive speed of said first roll so as to compensate for said slippage in drive imparted to said second roll by surface contact from said first roll; and

the surface speed of said second roll is less than the surface speed of said first roll by a predetermined amount so that surface contact with said first roll at squeezing force less than an initial amount tends to drive the second roll at an angular velocity slightly greater than said angular velocity of said drive means, thereby reducing the driving torque supplied by said drive means to said second roll when said surface contact slips due to squeezing forces exceeding said initial amount.

11. Apparatus for squeezing a warp of wet yarn to remove at least some of the moisture from the yarn, comprising:

a first roll across which the warp passes;

a second roll disposed to press against said first roll with the warp yarns squeezed between the two rolls;

means movably mounting said second roll along a predetermined path for selectably variable spacing between the two rolls, so as to selectably vary the squeeze loading applied to the warp yarns;

drive means connected to supply drive torque to said second roll; and

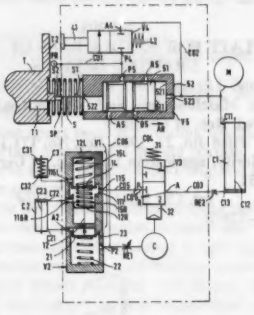
said drive means being operatively interconnected to move along said predetermined path with said mounting means as the position of said second roll varies, so that the squeeze loading is unaffected by variations in the drive torque supplied to said second roll by said drive means.

4,344,212

VALVE AND A WIRE CUTTING, SKINNING AND WRAPPING TOOL EMPLOYING THE VALVE

Frans P. J. Bolssens, Heide Kalmthout; Guy C. J. L. G. G. M. Franck, Borsbeek, and Henri Dehertefelt, Niel, all of Belgium, assignors to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 892,573, Apr. 3, 1978, abandoned. This application Jan. 15, 1981, Ser. No. 225,272
Int. Cl.³ B21F *3/04*; B25B *27/00*; F16K *11/07*; H01R *43/00*
U.S. Cl. 29—33 F **6 Claims**



5. A pneumatic control system controlling a number of successive cutting, skinning and wrapping operations of a wire cutting, skinning and wrapping tool comprising:

a first three-way valve including

an inlet port,

two outlet ports, and

first and second valve members independently displaceable by fluid pulses at said inlet port to cause said fluid pulses to appear alternately at said two outlet ports, said fluid pulses at said inlet port directly reappearing at said two outlet ports and directly causing said first and second valve members to pass through at least three successive positions for every two of said fluid pulses at said inlet port;

a first two-way valve mechanically coupled to said first three-way valve controlled by said second valve member;

a second three-way valve hydraulically coupled to said first three-way valve;

a four-way valve hydraulically coupled to said first three-way valve and said first two-way valve;

a second two-way valve hydraulically coupled to said four-way valve and a source of pressurized air;

a vessel hydraulically coupled to said second three-way valve;

a restrictor coupled between said four-way valve and said vessel to provide a delay mechanism for said second three-way valve; and

a trigger mechanism to mechanically act upon said four-way valve and said second two-way valve when triggered;

said first and second two-way valves, said second three-way valve and said four-way valve being able to collaborate with said first three-way valve in order to control said successive cutting, skinning and wrapping operations;

said source being connected to one port of said second two-way valve and one port of said four-way valve, an outlet port of said four-way valve being connected to one inlet port of said first two-way valve and to said vessel via said restrictor, said second three-way valve being actuated in the rest condition of said pneumatic control system and its exhaust port is coupled via its other port to an inlet of a wire skinning cylinder capable of operating a skinning mechanism of said tool, a third port of said second three-way valve being connected to an outlet port of said four-way valve which is not connected to said source of pressurized air in said rest condition and to an inlet port of said first three-way valve, one of said two outlet ports of said first three-way valve being connected to an inlet port of a double acting cylinder of a wire feeding mechanism of said tool, said double acting cylinder having an outlet port connected to another port of said first two-way valve, the other of said two outlet ports of said first three-way valve being connected to a wire cutting cylinder of a wire cutting mechanism of said tool, another port of said second two-way valve being connected to a wrapping motor of said tool, another outlet of said wire skinning cylinder and said four-way valve to bring the piston of said four-way valve to its rest condition so that when said trigger mechanism is operated a first time said four-way valve is activated and pressurized air is supplied to said wire feeding cylinder with said first valve members in a first given position to connect said one of said two outlet ports of said first three-way valve to said inlet port thereof and to said wire skinning cylinder a predetermined time interval thereafter, when said trigger mechanism is triggered a second time said second two-way valve is actuated so that pressurized air is supplied to said wire wrapping motor, to said wire skinning cylinder to bring its piston into its rest condition after a second predetermined time interval and to said four-way valve to bring this valve into its rest position so that said pressurized air to said first three-way valve is cut off and the next operation is prepared due to said first valve member being displaced into a second given position to connect said inlet port of said first three-way valve to said other of said two outlet ports thereof, when said trigger mechanism is pulled a third time and said four-way valve is actuated only, pressurized air is supplied to said wire cutting cylinder and to said wire skinning cylinder a predetermined time interval thereafter and when finally said trigger mechanism is pulled a fourth time, actuating said second two-way valve, said wire wrapping motor is actuated and the piston of said wire skinning cylinder returns to its rest position.

4,344,213

RIVET GUIDING APPARATUS

Winston C. Pray, Lombard, Ill., assignor to Flexible Steel Lacing Company, Downers Grove, Ill.

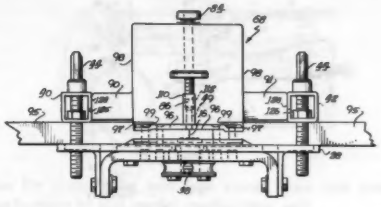
Continuation-in-part of Ser. No. 948,971, Oct. 5, 1978, Pat. No. 4,258,461. This application Jan. 25, 1980, Ser. No. 115,367

Int. Cl.³ B23P *19/00*

U.S. Cl. 29—243.5 **17 Claims**

1. An apparatus for holding and the aligning plurality of elongated rivet fasteners for driving through apertures in an upper belt fastener plate and through a belt and into apertures in a lower belt fastener plate, said apparatus comprising:

a base means for supporting the belt and a row of belt fasteners thereon and having anvil means thereon for deforming the lower ends of said rivet fasteners, a guide block shorter in length than said base means for positioning over the upper belt plate fasteners and moveable laterally on said base means through a plurality positions on said base means, a plurality of elongated vertically extending passageways in said guide block, each for receiving an elongated fastener and for guiding the same in vertical move-



ment into the apertures in the upper plate fasteners and through the belt to the apertures in the lower plate fastener, means for registering said guide block in each of a plurality of positions relative to said base means and for interconnecting said base means and said guide block to locate said guide block in alignment with the anvil means on said base means in each position and in alignment with the apertures in the upper plate fasteners and thereby with respect to apertures in said lower plate fasteners.

4,344,214

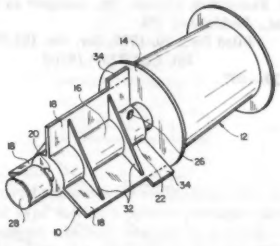
INTERNAL PIPE LINE DELIVERY DEVICE

Lawrence J. White, San Jose, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Jul. 31, 1980, Ser. No. 174,289

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—252 **18 Claims**



1. A remotely thermally activatable device for delivering a payload to a predetermined location within a pipe comprising:

carrier means for radially and axially supporting a payload;

driver means connected to said carrier means to axially move said carrier means within a pipe, said driver means extending axially and moving said carrier means when activated;

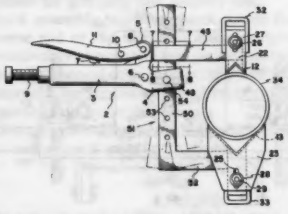
support means connected to said driver means to support said driver means within a pipe; and

thermally activatable trigger means connected to said driver means to actuate said driver means, said driver means moving said carrier means within the pipe with respect to said support means.

4,344,215
PIPEFITTER'S TOOL

Timothy C. Dearman, 3002 S. Main St., P.O. Box 937, Pearland, Tex. 77581

Continuation-in-part of Ser. No. 77,859, Sep. 21, 1979, Pat. No. 4,306,345. This application May 9, 1980, Ser. No. 148,417
Int. Cl.³ B25H *7/00;* B23K *37/04*
U.S. Cl. 29—281.5 7 Claims

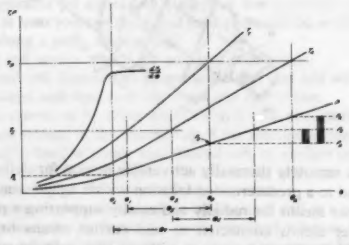


1. In a tool for use in joining a pipe to a fitting wherein one end of the pipe is to be accommodated in a bore at one end of the fitting and spaced a predetermined distance from a shoulder spaced inwardly from said one end of the fitting, said tool comprising a pair of arm members pivotally connected to one another for rotary movement about a first axis; a first clamp jaw; a second clamp jaw; means mounting a respective one of said jaws on each of said arm members for relative movement toward and away from one another into and out of clamping engagement with said pipe; and spacing means carried by at least one of said jaws for movements out of and into engagement with said pipe and having a thickness corresponding to said predetermined distance, the improvement wherein the mounting means for at least one of said jaws includes an elongate support joined at one end to said one of said jaws, and means coupling said support to one of said arms for bodily slidable adjustment relative thereto and for rocking movements of said support about a second axis parallel to and fixedly spaced from said first axis.

4,344,216
APPARATUS AND METHOD FOR TIGHTENING AN ASSEMBLY

Robert J. Finkelston, Colmar, Pa., assignor to SPS Technologies, Inc., Jenkintown, Pa.

Filed Dec. 10, 1979, Ser. No. 101,975
Int. Cl.³ B23P *19/06*
U.S. Cl. 29—407 12 Claims



1. Apparatus for tightening an assembly including a threaded fastener comprising:

driving means for imparting torque and rotation to the fastener to tighten the assembly, the torque-rotation curve which could be plotted for the assembly having a non-linear tightening portion followed by a substantially linear tightening portion;

means for supplying (1) a first preload signal representative of a predetermined preload which is to be induced in the fastener when the assembly has been tightened to a desired degree, (2) a second preload signal representative of the preload at the onset of said substantially linear tightening portion, and (3) a tension rate signal representative of the tension rate of the assembly;

torque sensing means responsive to said driving means for developing a torque signal representative of the torque imparted to the fastener;

angle sensing means responsive to said driving means for developing a first angle signal representative of the rotation imparted to the fastener;

means responsive to said torque signal and said first angle signal for developing a gate signal at said onset of said substantially linear tightening portion;

processing means reponsive to said first preload signal, said second preload signal, and said tension rate signal for developing a second angle signal representative of a tightening angle between said onset of said substantially linear tightening portion and said predetermined preload, said tightening angle being related to the difference between said predetermined preload and said preload at said onset of said substantially linear tightening portion divided by said tension rate;

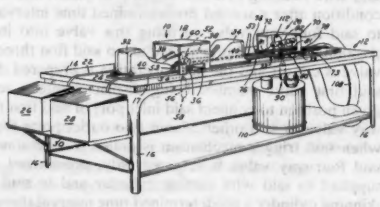
comparison means responsive to said first angle signal, said second angle signal, and said gate signal for comparing the rotation imparted to the fastener after said onset of said substantially linear tightening portion with said tightening angle and for developing a control signal when said rotation imparted to the fastener after said onset of said substantially linear tightening portion is equal to said tightening angle;

and control means for supplying said control signal to said driving means to stop said driving means from imparting torque and rotation to the fastener.

4,344,217
AUTOMATIC STAPLING AND CUTTING MACHINE

Joseph W. Katona, Walled Lake, Mich., assignor to Mills Products, Inc., Farmington, Mich.

Filed Nov. 30, 1979, Ser. No. 98,934
Int. Cl.³ B23P *17/00, 11/00*
U.S. Cl. 29—417 7 Claims



1. Apparatus for producing a plurality of bands each formed of two flexible strands secured to one another at the ends thereof but free of connection between said ends from two lengths of strand material, comprising connecting means for connecting together said two lengths of the strand material at two closely longitudinally spaced points, cutting means for cutting said strand material between said two closely longitudinally spaced points, and means for supporting said connecting means and said cutting means in spaced relation to one another so that said two lengths of strand material may be connected together by said connecting means at two closely longitudinally spaced points at one location along the length of said two lengths of strand material and subsequently connected together by said connecting means at two closely longitudinally spaced points at other locations along the length of said two lengths of strand material and also may be cut by said cutting means between said two closely longitudinally spaced points at all

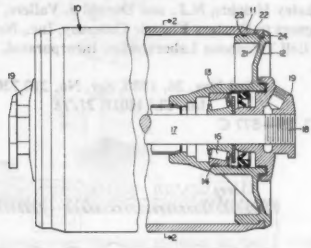
said locations to produce a plurality of said bands secured to one another at the ends thereof but free of connection between said ends, said connecting means comprising two staplers.

4,344,218

CONVEYOR IDLER ROLL ASSEMBLY AND METHOD OF PRODUCING SAME

Homer Hooper, Winfield, and R. B. Holland, Hodges, both of Ala., assignors to Continental Conveyor & Equipment Company, Inc., Winfield, Ala.

Continuation of Ser. No. 45,195, Jun. 4, 1979, abandoned. This application Sep. 22, 1980, Ser. No. 189,100
Int. Cl.³ B65G *39/10*
U.S. Cl. 29—516 1 Claim



1. A method for securing an idler roll cylinder of an idler roll assembly tor a conveyor to a pair of laterally spaced roll heads mounted within the respective ends of said roll cylinders comprising the steps of:

(a) forming a circumferentially extending outwardly opening groove in and around the outer periphery of each said roll head axially inward of the outer end thereof and facing the end of said roll cylinder adjacent thereto,

(b) forming a plurality of circumferentially spaced, outwardly opening recesses in the outer periphery of each said roll head facing the inner surface of said roll cylinder and extending laterally of said circumferentially extending outwardly opening groove, and

(c) spin forming the outer end portions of said roll cylinder adjacent each end thereof to form concomitantly inwardly projecting abutments as lock elements which are pressed into said circumferentially spaced recesses and an integral inwardly extending, annular abutment as a lock member at each end thereof which is forced into the confines of said groove with the outer ends of said roll cylinder terminating axially inward of the outer ends of said roll heads and defining smooth contoured ends for said roll heads with the outer surfaces of said roll heads extending beyond the ends of said roll cylinder.

4,344,219

APPARATUS FOR ARRANGING PARTS

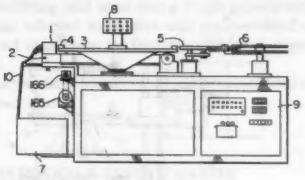
Tetsuo Tanabe, Nagaokakyo; Kazumi Takamori, Takatsuki; Akira Matueda, Ibaraki; Kiyoshi Matsui, Ibaraki; Junichi Omura, Ibaraki, and Hitoshi Miyamoto, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 26, 1979, Ser. No. 106,843
Claims priority, application Japan, Aug. 3, 1978, 53-95335
Int. Cl.³ B21F *45/00*
U.S. Cl. 29—564.6 5 Claims

1. An apparatus for arranging various kinds of electric parts in a predetermined order, each electric part having leads extending in one direction therefrom, comprising:

a plurality of cutter mechanisms for cutting primary taped parts associated therewith, wherein said primary taped parts include primary electric parts of one kind which are arranged at a constant pitch with their leads adhesively held between a pair of tapes, and wherein said cutter mechanisms each cut their associated primary taped parts at spaces between adjacent primary part to form tape pieces having a width corresponding to said constant pitch and which carry said electric parts by said leads;

a plurality of carrier mechanisms for holding said electric parts by retaining said tape pieces thereon, and for carrying said tape pieces;



means for transferring said tape pieces from said cutter mechanisms to said carrier mechanisms; and

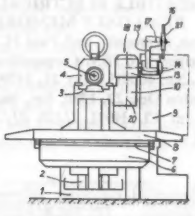
means for attaching said tape pieces from said carrier mechanisms to secondary adhesive tapes in said predetermined order at said constant pitch so as to obtain secondary taped parts arranged in said predetermined order.

4,344,220

TOOL EXCHANGE APPARATUS FOR BORING MILLS AND METHOD FOR EXCHANGING TOOLS

Michel E. Sachot, Orsay, France, assignor to Societe Hure S.A., Bagneux, France

Filed Nov. 28, 1978, Ser. No. 964,174
Claims priority, application France, Nov. 30, 1977, 77 36028
Int. Cl.³ B23Q *3/157*
U.S. Cl. 29—568 15 Claims



1. In an improved apparatus for exchanging tools on milling machines of the type having a spindle carriage horizontally slidable on a support which is mounted to a frame, a spindle mounted to said carriage, a magazine in which said tools are disposed said magazine having a tool exchange position and means for transferring said tools from said magazine to said spindle, said transfer means having a rotatable pincer arm and at least two pincers situated on the terminal edge of said pincer arm wherein the improvement comprises:

a head rotatable about a vertical axis fixed relative to said magazine;

a crank having first and second horizontal axes, said crank mounted to said head for rotation about said first horizontal axis and for translation along said first horizontal axis;

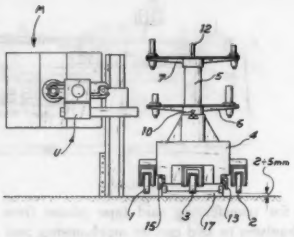
said pincer arm mounted to said crank for rotation about said second horizontal axis, and said magazine presenting said tool to an exchange station in horizontal orientation.

4,344,221

MACHINE TOOL WITH PORTABLE TOOL RECEIVING CARRIAGE

Giacomo Pagani, Piacenza, Italy, assignor to JOBS S.p.A., Italy

Filed Jul. 3, 1980, Ser. No. 165,752
Claims priority, application Italy, Feb. 29, 1980, 20308 A/80
Int. Cl.³ B23Q *3/157*; B23B *3/36*
U.S. Cl. 29—568 **4 Claims**



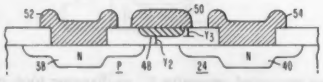
1. An apparatus for receiving a tool from a tool transferring means comprising a platform mounted adjacent to the transferring means, a portable tool magazine carriage mounted on said platform for alignment with the platform, means for movably coupling said carriage to said platform, and means for movably positioning said carriage relative to said platform, and wherein said carriage comprises a base member, a column vertically mounted to said base member, and a plurality of tool discs horizontally connected to said column in a vertically spaced and aligned relationship; and wherein said coupling means comprises alongated counterguides fixed to opposite sides of said platform, guide members depending from said carriage adapted to engage said counterguides, a plate member connected to a lower portion of said column, a sleeve member mounted on said platform for rotation, and a key member connected to said sleeve member adapted to engage said plate member.

4,344,222

BIPOLAR COMPATIBLE ELECTRICALLY ALTERABLE READ-ONLY MEMORY

David L. Bergeron, Winooski, and Paul H. Smith, Colchester, both of Vt., assignors to IBM Corporation, Armonk, N.Y.

Division of Ser. No. 40,805, May 21, 1979, abandoned. This application Oct. 22, 1980, Ser. No. 199,179
Int. Cl.³ H01L *21/26, 21/28*
U.S. Cl. 29—571 **9 Claims**



1. A process for forming an electrically alterable charge storage node on a semiconductor substrate of a first conductivity type, having a silicon dioxide insulating layer on the surface of the substrate, comprising the steps of:

depositing a first layer of metal on the surface of said silicon dioxide layer, having a thickness which, in combination with the thickness of the silicon dioxide layer, will serve to mask a subsequent ion-implantation step;

ion implanting a conductivity enhancing impurity of a second conductivity type through said silicon dioxide layer adjacent to said metal layer, to form an ion-implanted region having a terminal portion aligned with the edge of said metal;

sintering said metal layer to initiate a solid state reaction between said metal and said silicon dioxide layer, forming a metal oxide charge storage region in said silicon dioxide layer which is substantially aligned with said terminal portion of said ion-implanted region and said metal layer;

stripping said metal layer; and

depositing a second metal layer over said metal oxide charge storage region, as a programming gate for said electrically alterable storage node;

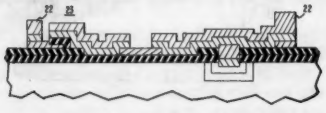
whereby an electrically alterable charge storage node is formed.

4,344,223

MONOLITHIC HYBRID INTEGRATED CIRCUITS

Gary A. Bulger, Coplay; Lyle D. Heck, Reading; Robert D. Huttemann, Wescosville; Joseph M. Morabito, Bethlehem; Raymond C. Pitetti, Wescosville, all of Pa.; Burton A. Unger, Berkeley Heights, N.J., and Donald J. Vallere, Reading, Pa., assignors to Western Electric Company, Inc., New York, N.Y. and Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 26, 1980, Ser. No. 210,730
Int. Cl.³ H01L *21/18*
U.S. Cl. 29—577 C **12 Claims**



1. A method for fabricating thin film resistor (**16**) and capacitor (**23**) components on an insulating layer (**11,12**) formed over a semiconductor substrate (**10**) where said substrate includes semiconductor devices (**13**) formed therein and ohmic contacts (**14**) to said devices characterized in the steps of defining a capacitor anode (**15'**) selectively on said insulating layer from a first metal layer; depositing a layer of resistive material over the resulting structure and defining a resistor (**16**) in a selected area; forming a mask (**17**) and a first interconnect pattern (**17'**) for selective oxidation of the capacitor anode by depositing a second metal layer and etching selected areas; forming a dielectric (**18**) on the capacitor anode by anodization in an electrolyte at a low voltage; removing the second metal layer; forming the capacitor counter electrode and a second interconnect conductor pattern by depositing a third metal layer (**19,20**) and etching selected areas; and stabilizing said resistor and capacitor by heating the resulting structure in an atmosphere comprising steam at high pressure.

4,344,224

METHOD OF MAKING HERMETICALLY SEALED SWITCH ASSEMBLY

Albert F. Ditzig, Hoffman Estates, Ill., assignor to Molex Incorporated, Lisle, Ill.

Division of Ser. No. 6,566, Jan. 26, 1979, Pat. No. 4,302,637. This application Nov. 17, 1980, Ser. No. 207,224
Int. Cl.³ H01H *11/00*
U.S. Cl. 29—622 **7 Claims**

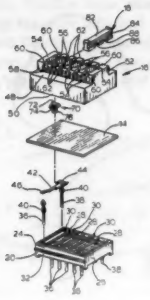
1. A method of making a switch assembly including forming a base member with a contact receiving cavity open at the top and defined by a floor that is laterally enclosed by side wall means, forming first terminal means and mounting said first terminal means in the cavity, forming second terminal means with a resilient contact blade portion and mounting said second terminal means in the cavity so that an end of the blade portion is spaced from said first terminal means, said contact blade portion being movable between a normally open position wherein said end contacts said first terminal means, forming a cover with means for mounting an actuator assembly thereon, and forming an actuator assembly including a push member mounted on the mounting means of the cover for moving the

contact blade portion between its open and closed positions, the improvement in said method comprising:

providing a thin, stretchable, resilient, impermeable sealing gasket;

placing said sealing gasket on top of the base member so that it overlies said cavity;

forming said cover and said base member to include interengaging means to lock said cover to said base member;



placing said cover over the base member so that it engages the periphery of said sealing gasket;

locking said cover and gasket to said base member by means of said interengaging means to form a hermetic seal over said cavity; and

mounting said push member in a manner so that it engages the gasket and is movable against the resilient force thereof to push the contact blade portion between its open and closed positions.

4,344,225

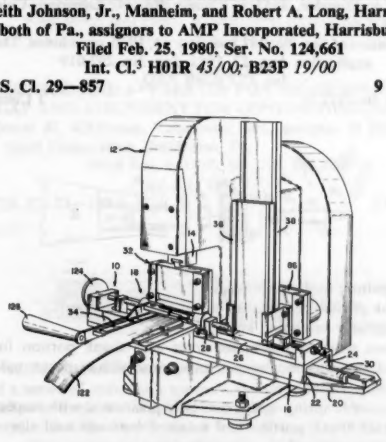
PRE-ASSEMBLY AND TERMINATING APPARATUS

Keith Johnson, Jr., Manheim, and Robert A. Long, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 25, 1980, Ser. No. 124,661

Int. Cl.³ H01R *43/00*; B23P *19/00*

U.S. Cl. 29—857 **9 Claims**



1. A method of terminating multi-conductor cable comprising the steps of:

dispensing a cover and a housing preloaded with a plurality of terminals in a preassembly station;

preassembling said cover and said housing;

transporting said preassembled cover and housing to a terminating station;

inserting a multi-conductor cable into said preassembled cover and housing; and

pressing the cover against the housing to effect termination of the cable and final assembly of the cover and housing.

3. An apparatus for preassembling components in a first station, transporting and finally assembling them in a second station comprising:

means for dispensing first and second units in said first station;

means for aligning said units for preassembly;

means for assembling said units into a single preassembly;

transport means adapted to receive said preassembled units and move and align them for final assembly in said second station; and

means for effecting final assembly of said preassembled units at said second station.

4,344,226

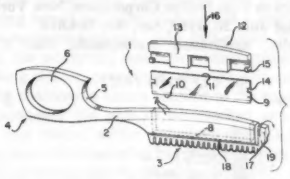
DISPOSABLE SAFETY RAZOR

Joseph W. Blake, III, R.R. #2, Box 106, Kitchewan Rd., South Salem, N.Y. 10590

Filed Apr. 17, 1980, Ser. No. 140,452

Int. Cl.³ B26B *21/12*

U.S. Cl. 30—31 **8 Claims**



1. A disposable razor, comprising

a razor body, having an upper side and a lower side, a rear portion constituting a handle and a front portion provided with a slot having an open end adjacent said lower side and extending towards said upper side;

a bladeguard extending lengthwise of said slot at said open side and having a comb-shaped edge portion;

a razor blade in said slot and having a cutting edge extending out of said open side and located opposite said comb-shaped edge portion; and

means for retaining said blade in said slot, said bladeguard being connected to said body at spaced locations by break-way portions and including a gripping portion engageable by the fingers of a user so as to effect relative twisting of said bladeguard and body and cause said break-way portions to break with resultant detaching of the bladeguard from the body.

4,344,227

CLEAN-OUT MECHANISM FOR TWIN BLADE SHAVING UNIT

Evan N. Chen, Fairfield; James S. Emmett, Ansonia; Frank A. Ferraro, Trumbull, and Anthony J. Peleckis, Trumbull, all of Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 971,170, Dec. 20, 1978, abandoned, which is a continuation of Ser. No. 866,127, Dec. 30, 1977, abandoned. This application Aug. 25, 1980, Ser. No. 180,756

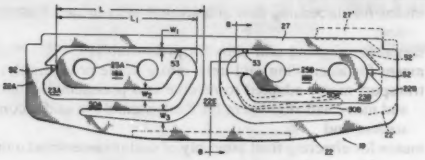
Int. Cl.³ B26B *21/22*

U.S. Cl. 30—41 **10 Claims**

1. In a razor blade system including a seat portion, a cap portion, and a pair of razor blades with cutting edges on the forward edges thereof fixedly positioned between the seat and cap portions, the blades being in spaced relation to each other, the improvement comprising:

integral means interposed between said pair of razor blades defining spacer means for maintaining said blades in said spaced relation and ejector means resiliently connected to

said spacer means for ejecting shaving debris from therebetween, said spacer means and said resiliently connected ejector means including an ejector bar being molded in unitary fashion to define a single piece-part all fabricated



from the same starting material said single piece-part including breakaway tabs to afford temporary rigidity to facilitate handling during manufacture of the blade system.

4,344,228

SHAVING APPARATUS

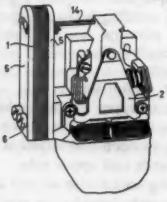
Freddy Haes; Cornelis M. Reynhout; Guillaume M. P. G. Hermes, all of Eindhoven, and Ebbe Boiten, Assen, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,614

Claims priority, application Netherlands, Jul. 3, 1979, 7905157

Int. Cl.³ B26B *19/12*

U.S. Cl. 30—43.9 **5 Claims**



1. A shaving apparatus comprising an external cutting element; an internal cutting element cooperating with said external cutting element and being drivable with a reciprocating movement relative to the external cutting element; and a connecting element securing the internal cutting element to the external cutting element, said connecting element being flexible in the direction of driving and rigid in directions extending substantially transversely of the direction of driving; the external cutting element together with two legs constituting a U-shaped part of a sheet material and the internal cutting element together with the connecting element constituting a strip also made of a sheet material and positioned between the legs of the U-shaped part; the internal cutting element being situated at the end of the strip near the transverse portion of the U-shaped part and the other end of the strip being connected to the legs of the U-shaped part.

4,344,229

FLEXIBLE TREE SAW

Robert M. Johnson, 11 Jana Dr., Weston, Conn. 06883

Filed Feb. 6, 1980, Ser. No. 119,167

Int. Cl.³ B27B *21/00, 33/14*

U.S. Cl. 30—166 R **7 Claims**

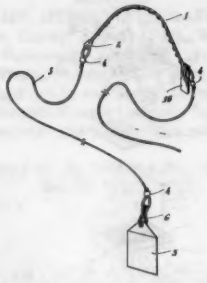
1. A flexible saw for sawing high branches from trees comprising:

a flexible cutting area, and

flexible holding means on each end of the flexible cutting area for oscillating the cutting area against a branch of a tree to be cut,

said cutting area including:

a flexible base member comprising a chain made from a plurality of links pivotably connected to each other and a series of spaced apart cutting teeth secured thereto, at least some of said spaced apart cutting teeth facing in one direction along the flexible member and some of said cutting teeth being interspersed between said teeth facing in said one direction and facing in the other direction along the flexible base member, whereby each tooth facing in said one direction will cut when the cutting area is drawn in said one direction, and the teeth facing in the



other direction will be cleared of debris, and when cutting action is reversed, vice-a-versa,

said cutting teeth extending along one edge of said flexible base member, and

means connected to said flexible base member for orienting said member so that said one edge is in contact with the tree branch to be cut,

said orienting means including a counterweight on one end of said flexible base member.

4,344,230

LEATHER TOOLING APPARATUS

Donald A. Olander, 3555 E. County Rd. 14, Loveland, Colo. 80537

Continuation of Ser. No. 941,868, Sep. 13, 1978, abandoned. This application Aug. 27, 1981, Ser. No. 297,019

Int. Cl.³ B26B *7/00*

U.S. Cl. 30—272 R **1 Claim**

1. A cutting tool comprising:

a shank portion terminated in a shoulder member;

an angularly extending knife portion;

a sleeve member positioned over said shank portion for rotational and translational movement with respect to said shank portion; and

compressible spring means coaxially positioned with respect to said shank portion and retained between said sleeve member and said shoulder member.

4,344,231

AREA MAPPING APPARATUS

Donald G. Martinez, P.O. Box 584, Calistoga, Calif. 94515

Filed Mar. 19, 1981, Ser. No. 245,415

Int. Cl.³ G01B *3/02*

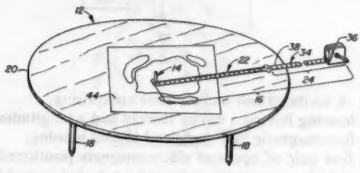
U.S. Cl. 33—1 G **3 Claims**

1. Apparatus for mapping a portion, such as the green, of a

land surface area, such as a golf course, onto a sheet of paper comprising:

a generally planar board having a bottom and a top and having a plurality of depending supports attached to said bottom, said supports located about the center of said board near the periphery thereof and configured to provide stable support for said board on said land surface area;

a unitary, extendible measuring element including an inner, realtively stiff, proportional measuring segment and an outer, full scale, flexible tape measuring segment, said inner measuring segment attached at its outer end to an inner end of said flexible measuring segment providing a common measurement axis for said measuring segments of said measuring element when said measuring element is



pulled taut during use, said inner measuring segment having a pivot point at is inner end, said inner and outer measuring segments having respective distance scales marked thereon, said distance scales having generally coincident zero points at the pivot point of said inner measuring segments; and

means for pivotally attaching said inner measuring segment at said pivot point thereof to a central portion of said top for movement of said inner and outer measuring segments about said pivot point in a plane generally parallel with said top;

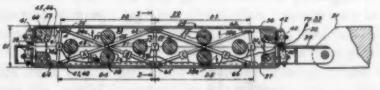
whereby the outline of the surface area portion can be mapped onto the sheet of paper mounted to the board by transferring actual surface measurements from said outer full-scale measuring segment to the paper at a reduced scale using said inner, proportional measuring segment.

4,344,232

METHOD AND APPARATUS FOR MEASURING ROLL GAP AND ALIGNMENT FOR CONTINUOUS CASTERS

Ernest H. Kihlstrom, Valparaiso, Ind., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Sep. 9, 1980, Ser. No. 185,474
Int. Cl.³ G01B 7/00
U.S. Cl. 33—143 L **23 Claims**



12. Apparatus for measuring roll position between roll faces of a series of oppositely spaced pairs of conveyor rolls which define a strand travel path, comprising:

(a) strand-like carrier means movable to plural roll locations along an axis of said path, said carrier means having resiliently deformable parallel sensing surfaces exerted outwardly and extending between two or more pairs of roll faces; and

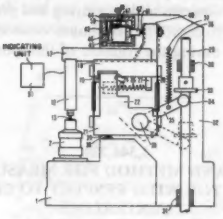
(b) distance measuring means pivotally linked to sense a dimension including lateral and diagonal distance between said carrier means sensing surfaces for generating a signal representing roll position of opposite roll faces, said distance measuring sensed independently of a neutral or reference plane.

4,344,233

APPARATUS FOR CHECKING DIAMETRAL DIMENSIONS

Gastone Albertazzi, Bologna, Italy, assignor to Finike Italiana Marposs S.p.A., S. Marino di Bentivoglio, Italy

Filed Sep. 15, 1980, Ser. No. 186,891
Claims priority, application Italy, Sep. 14, 1979, 3490 A/79
Int. Cl.³ G01B 7/12
U.S. Cl. 33—178 E **10 Claims**



1. An apparatus for checking diametral dimensions of a cylindrical surface of a mechanical part, comprising: a base; measuring means including two probes adapted to cooperate, along a measurement axis, with two points of the cylindrical surface, the measuring means providing measurement signals; processing circuits connected with the measuring means; support and positioning means coupled to the base for supporting and positioning the part to be checked and the measuring means; and control means connected to the support and positioning means for displacing the probes in cooperation with the cylindrical surface and for obtaining a relative motion between the probes and the cylindrical surface, wherein the control means are adapted to control said relative motion as a scanning motion with a displacement of the relative position of the measurement axis, with respect to the base and the cylindrical surface geometric axis, having a component perpendicular to the measurement axis, for arranging the measurement axis and the geometric axis both in coplanar and in non-coplanar positions, the processing circuits being adapted to process the measurement signals obtained during the scanning motion for detecting the diametrical dimension of the cylindrical surface.

7. An apparatus for checking a diameter of a cylindrical surface of a mechanical part, comprising measuring means including two probes adapted to cooperate, along a measurement axis, with two points of the cylindrical surface, the measuring means providing measurement signals; processing circuits connected with the measuring means; support and positioning means for supporting and positioning the part to be checked and the measuring means, the support and positioning means including a movable arm for supporting the part; and control means connected to the support and positioning means for displacing the probes in cooperation with the cylindrical surface and for obtaining a relative motion between the probes and the cylindrical surface, wherein the control means are adapted to displace said arm with respect to the measuring means for permitting the probes to scan a portion of the contour of the cylindrical surface and to obtain said relative motion as a scanning motion with a relative displacement of the position of the measurement axis, with respect to the cylindrical surface geometric axis, having a component perpendicular to the measurement axis, for arranging the measurement axis and the geometric axis both in coplanar and in non-coplanar positions, the processing circuits being adapted to process the measurement signals obtained during the scanning motion for detecting the diameter of the cylindrical surface.

10. An apparatus for checking the diameter of a cylindrical surface of a mechanical part, the cylindrical surface defining a geometric axis, comprising:

spindle means rotatable about a rotation axis for at least 180°;

the spindle means including an eccentric clamping device

adapted to clamp the part with a pre-set eccentricity between said geometric axis and rotation axis; and

measuring and processing means including two movable probes adapted to cooperate, along a substantially stationary measurement axis, with two points of the cylindrical surface, the measuring means providing a measurement signal responsive to the distance of said points,

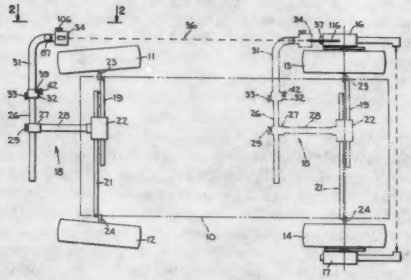
wherein said pre-set eccentricity has a value sufficient to permit the probes to reach, during rotation of the spindle means, a diametral position with respect to the cylindrical surface and wherein said measuring and processing means are adapted to detect the maximum value of said measurement signal during the rotation of the spindle means.

4,344,234

APPARATUS AND METHOD FOR MEASURING REAR WHEEL TOE WITH RESPECT TO CHASSIS CENTERLINE

Melvin H. Lill, San Jose, and Thomas E. Roberts, Jr., Saratoga, both of Calif., assignors to FMC Corporation, Chicago, Ill.

Filed Sep. 4, 1980, Ser. No. 184,431
Int. Cl.³ G01B *11/275*
U.S. Cl. 33—228 **17 Claims**



1. Apparatus for measuring the toe of one of a pair of nonsteerable wheels on a vehicle relative to the centerline of the vehicle chassis, wherein an alignment head is mounted on the one nonsteerable wheel casting a light beam forwardly of the chassis in a direction substantially parallel to the plane of rotation of the one wheel, wherein a light beam detector is provided in a vertical plane through the projector extending parallel to the chassis centerline, and wherein a centering gage is adapted to extend between any pair of vehicle wheels, said centering gage comprising

a housing,

means for maintaining said housing in a constant position relative to the center point between the any pair of vehicle wheels,

a laterally extending arm mounted on said housing having an outer end reaching outboard of one of the wheels in the pair,

a centering gage head attached to said outer end of said arm and having an aperture thereon operating to receive a portion of the light beam,

means for adjusting the length of said laterally extending arm to place said aperture in the aforesaid vertical plane parallel to the chassis centerline,

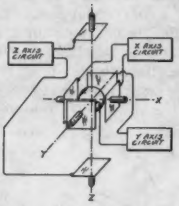
said aperture being in optical communication with the light beam detector, whereby a signal indicative of the toe of the one nonsteerable wheel relative to the chassis centerline is provided in response to sensing of said light beam portion.

4,344,235

LEVITATED BALL INCLINOMETER

Thomas E. Flanders, Houston, Tex., assignor to General Electric Co., Philadelphia, Pa.

Filed Dec. 29, 1980, Ser. No. 223,381
Int. Cl.³ G01C *9/06, 9/16*
U.S. Cl. 33—366 **4 Claims**



1. A levitated ball inclinometer comprising:

a housing having a cavity therein and a longitudinal axis;

a ferromagnetic ball contained in said housing;

a first pair of opposed electromagnets positioned to have pole faces extending into said cavity but spaced from said ball;

a second pair of opposed electromagnets positioned to have pole faces extending into said cavity but spaced from said ball;

said first and second pairs of electromagnets also positioned to be orthogonal to said longitudinal axis and to each other;

means for applying a high frequency alternating current to said ball;

means for detecting the difference in currents flowing from the ball to the pole faces of the first pair of electromagnets and for producing an output signal proportional thereto;

means for detecting the difference in currents flowing from the ball to the pole faces of the second pair of electromagnets and for producing an output signal proportional thereto; and

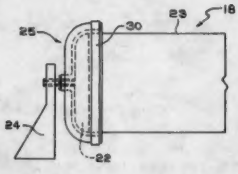
means for applying currents proportional to said output signals to the electromagnets to maintain the ball centered between said pairs of pole faces.

4,344,236

WEB DRYING APPARATUS

Gale E. Lindeen, Greenville, S.C., assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Dec. 17, 1980, Ser. No. 217,479
Int. Cl.³ F26B *13/08*
U.S. Cl. 34—110 **1 Claim**



1. A drying apparatus for drying a traveling web comprising a hollow cylinder, said cylinder having a pair of end portions and an intermediate cylindrical portion, means connected to said cylinder for rotating said cylinder about its central axis, heating means connected to said cylinder for heating the interior of said cylinder, heat insulating end caps mounted on the respective end portions of said cylinder for restricting the flow of heat energy from said end portions, each of said end caps are

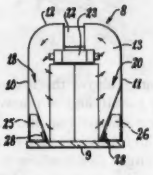
made from an inner layer of insulating material and an outer layer of rubber with a layer of foil interposed between said inner layer and said outer layer of rubber, and a circumferentially extending strap around the periphery of said cylinder to secure said cap to said cylinder.

4,344,237

WOOD DRYING KILN

John M. Willington, Mount Eliza, Australia, assignor to A.P.M. Wood Products Pty. Ltd., Tumut, Australia

Filed Dec. 9, 1980, Ser. No. 214,683
Claims priority, application Australia, Dec. 13, 1979, PE1707
Int. Cl.³ F26B *9/06*
U.S. Cl. 34—191 **6 Claims**



1. A kiln for drying timber comprising:

an elongated housing having a base, two side walls and a top wall and two end walls defining a timber treatment zone;

a gas circulation passageway having a top passageway portion extending over said timber treatment zone, a side passageway portion extending down one side of said timber treatment zone, a treatment passageway portion extending through said timber treatment zone, and a side passageway portion extending up the other side of said timber treatment zone merging with said top passageway portion, each said side wall being sloped whereby each of said side passageway portions is broad at the top of the kiln and narrower at the bottom of the kiln thereby to provide a substantially even rate of flow of gases at various levels within said treatment zone, said top passageway portion forming a rounded junction with each said side passageway portion;

reversible gas circulation means within said top passageway portion for maintaining the circulation of treatment gas in said other direction through said gas passageway thereby enabling the direction of gas flowing through said treatment zone to be reversed; and

at least one inlet duct for hot air and other gases for timber treatment, said inlet duct extending longitudinally beneath said top passageway portion and above said treatment zone, said inlet duct having one or more inlet ports between said duct and said gas circulation passageway for injecting gas into said gas circulation passageway in the vicinity of said top passageway portion, said inlet duct having an internal baffle means providing a lumen in said inlet duct which decreases in lateral cross-sectional area from the end of introduction of treatment gas to the end remote therefrom.

4,344,238

MULTI-PURPOSE CRAMPON

Leonard F. Peyser, Old Sleepy Hollow Rd., Briarcliff Manor, N.Y. 10510

Filed Jul. 15, 1980, Ser. No. 169,105
Int. Cl.³ A43B *3/10*; A43C *15/00*
U.S. Cl. 36—7.6 **12 Claims**

1. A multi purpose crampon for detachable securement to hiking boots or the like, comprising,

respective sole and heel creeper plates, each of said plates having a substantially planar upper surface to permit desired positioning thereof beneath a boot sole and heel, and a plurality of gripper points extending from the lower surface thereof,

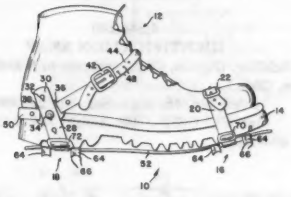
flexible sole strap means interconnecting said sole and heel plates,

toe securing means including a flexible strap extending from said sole plate to secure the sole plate to a toe portion of a boot,

heel securing means including a flexible strap extending from either side of said heel plate,

slide members adjustably connected to said straps on either side of both said toe plate and heel plate,

means interconnecting end portions of said heel securing



means for extending forwardly to overly the instep portion of a boot, and,

further means interconnecting said end portions for extending rearwardly around the heel portion of a boot,

said instep and heel interconnecting means thereby together securing said heel plate to a boot,

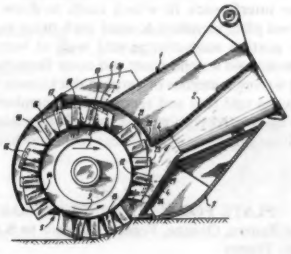
whereby said sole and heel plates may be positioned with respect to a given boot, and the said slide members adjusted with respect to the respective straps to an adjacent edge portion of the boot, and the several straps means and securing means connected thereby to secure the crampon with respect to any given hiking boot or the like to impart traction thereto in hiking.

4,344,239

DRAGGING TYPE HEAD FOR A SUCTION DREDGER

Pieter Verboom, Alblasserdam, Netherlands, assignor to IHC Holland N.V., Papendrecht, Netherlands

Filed Jul. 15, 1980, Ser. No. 169,208
Claims priority, application Netherlands, Jul. 17, 1979, 7905566
Int. Cl.³ E02F *3/88*
U.S. Cl. 37—66 **3 Claims**



1. In a dragging type suction head of a suction dredger, said head being provided with a cylindrical cutting device comprising a cylindrical drum rotatably supported within the suction head, said drum having upon its outer surface a plurality of cutting blades, said suction head having the form of a cap surrounding at least the upper portion of the cutting device and connected to a suction conduit; the improvement in which the cutting device is driven in a direction of rotation such that the force exerted by the cutting blades upon the soil is directed in

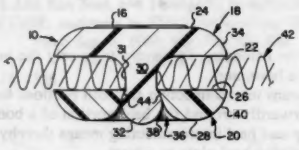
the direction of dragging, the cutting blades being arranged upon the drum surface in several sets following each other in the circumferential direction of rotation of the drum, each set of blades having a leading blade and two rows of separate blades arranged according to the legs of a V extending rearwardly from said leading blade with respect to the direction of rotation, said leading blade being disposed in the central plane of the drum perpendicular to its axis and formed by a flat plate in said plane as well as a blade perpendicular to said flat plate, whilst the other individual and spaced apart blades of each set are at an acute angle to a plane perpendicular to the axis of the drum, each blade having its leading edge at a greater distance from the central plane than its trailing edge.

4,344,240

IDENTIFICATION SNAP

Karl H. Schiller, Dayton, Ohio, assignor to S and S Associates, Dayton, Ohio

Filed Jan. 16, 1981, Ser. No. 225,486
Int. Cl.³ G09F *3/08;* A44B *1/18, 1/38*
U.S. Cl. 40—20 R **9 Claims**



1. An identification snap for attachment to woven material comprising:

a first plate member having first inner and outer faces;

post means projecting from said first inner face;

said post means including a shank portion and a bulbous tip of larger diameter than said shank portion;

a second plate member having second inner and outer faces;

said second plate member including a centrally disposed orifice extending from said second inner face to said second outer face for receiving said post means therein;

said orifice being defined by a substantially frusto-conical wall which extends from said second outer face to said second inner face and converges toward said second inner face;

said frusto-conical wall being shaped such that, when said first and second plate members are joined such that their respective inner faces oppose each other, said wall engages said bulbous tip only at a posterior portion thereof in an interference fit which tends to draw said first and second plate members toward each other such that posterior portion may engage said wall at varying locations between said second inner and outer faces thereby permitting woven materials of varying thicknesses to be clamped between said first and second plate members; and

means associated with at least one of said plate members for distinguishing one of said snaps from another of said snaps.

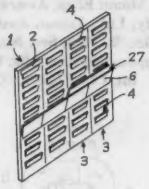
4,344,241

PLATE FOR CARD DISPLAY BOARD

Raymond Tourre, Orange, France, assignor to S.A. VAL-REX, Orange, France

Filed Apr. 23, 1981, Ser. No. 256,817
Claims priority, application France, Apr. 28, 1980, 80 10113
Int. Cl.³ G09F *1/10*
U.S. Cl. 40—124.2 **7 Claims**

1. A plate adapted to be mounted on a display board, said plate comprising a plane body provided on its rear face with a bar set back from the lower edge of said body, said plate being adapted to be mounted on a board designed for the display of T-shaped cards, said board being of the type which includes vertical and parallel lines of superposed horizontal slots, said plate including a plane body having a horizontal dimension at least of equal size to the length of the slots, said plate comprising on its vertical side edges two mutually complementary assembling parts, an attachment rib on the rear face of said body, a bar projecting rearwardly from said rib, said bar being directed toward the lower edge of said body and being of a height smaller than the distance between the lower edge of said body and the upper edge of said bar, said bar being disposed



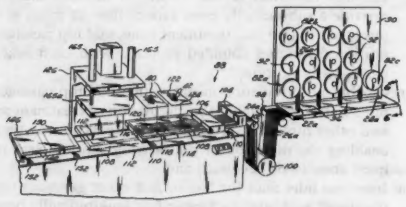
parallel to and a distance above the lower edge of said body, said bar including a rabbit and a rearwardly directed face portion at the junction of said bar and rib, said face portion diverging forwardly and downwardly relative to the plane of said body at an acute angle, said body including on its rear face adjacent the vertical side edges thereof a pair of rearwardly projecting heels, the rearmost face of said heels extending forwardly and downwardly at an angle substantially identical to said acute angle of said rearwardly directed face portion.

4,344,242

MACHINE FOR MANUFACTURE OF PANEL TILE

Arthur T. Spees, Tustin, Calif., assignor to Visu-Flex Corporation, Orange, Calif.

Division of Ser. No. 906,917, May 16, 1978, Pat. No. 4,232,463.
This application Oct. 6, 1980, Ser. No. 194,218
Int. Cl.³ G09F *1/10;* A47G *7/06;* B26D *7/06*
U.S. Cl. 40—373 **22 Claims**



1. Apparatus for the manufacture of a storage device for flat, flexible data elements, comprising:

means for cutting one or more sheets of flexible resilient material into a plurality of strips;

means for aligning said strips in a parallel overlapping relationship;

first attaching means for attaching said strips to each other proximate the ends thereof to form a layered panel of overlapping pocket entrances; and

second attaching means for attaching a pocket forming sheet to the side of said panel opposite said pocket entrances, the pockets formed by said pocket forming sheet being of depth substantially greater than the width of said strips.

4,344,243

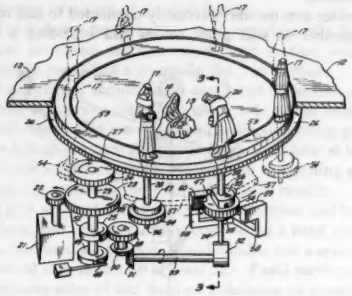
ANIMATED CHRISTMAS DISPLAY DEVICE

Leon Reszka, 49 Huber Pl., Yonkers, N.Y. 10704

Filed Jul. 7, 1980, Ser. No. 166,480
Int. Cl.³ G09F *19/08;* A63H *11/00, 13/02*
U.S. Cl. 40—415 **5 Claims**

1. An animated display device comprising means for moving

a plurality of human figures in sequence past a reference location, bowing means for causing each of said figures to bow towards said reference location when it reaches a predetermined position, rotation means for causing each of said figures to turn towards said reference location before bowing, turn



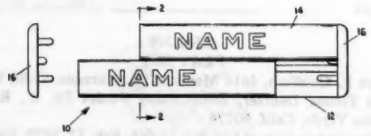
away after bowing, and then to move away from said position, said rotation means including a plurality of gears, each of said figures being secured to one of said gears, and first and second racks positioned in the path of movement of said gears so as to engage them and rotate each gear first in one direction, and then in the other direction.

4,344,244

SIGNAGE SYSTEM AND METHOD OF MAKING SAME

Charles R. Tyke, 7427 Leyton, SE., Ada, Mich. 49301

Filed Jun. 12, 1980, Ser. No. 158,987
Int. Cl.³ G09F *7/02, 7/22, 11/00*
U.S. Cl. 40—611 **15 Claims**



1. A signage system comprising:

a frame including a vertical support plate having horizontal frame mounting flange means on at least one side thereof, the frame mounting flange means having ends facing the side edges of the support plate;

at least one removable plate-shaped lettering insert mountable on the frame, the lettering insert having signage on the front surface thereof and insert mounting flange means on the back surface thereof, the insert mounting flange means mating with the mounting flange means on the support plate to hold the lettering insert on the frame, the lettering inserts being mountable on the frame by mating the ends of the insert mounting flange means with the ends of the sign mounting flanges on the frame and sliding the lettering insert horizontally across the frame;

removable end caps that cover the ends of the frame and lettering inserts, the end caps comprising at least two opposed resilient fingers that fit over and press resiliently against opposite sides of the support plate to hold the end caps on the frame, the end caps being removable by manually pulling the end caps horizontally away from the frame, thus exposing the ends of the lettering inserts and permitting removal of lettering inserts by sliding them horizontally off the mounting flange means through the opened end; and

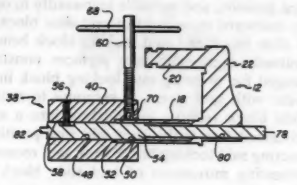
frame mounting means attachable to the frame for mounting the sign for visual display.

4,344,245

REVOLVER CRANE BARREL EXTENDER AND ALIGNMENT TOOL

Fred R. Miller, 2620 E. 32nd St., Davenport, Iowa 52807

Filed Jun. 26, 1980, Ser. No. 163,039
Int. Cl.³ F41C *27/00*
U.S. Cl. 42—1 R **7 Claims**



1. A revolver crane barrel extender and alignment tool comprising:

a tool body **40**,

an alignment stud **54**, and

a stylus **60**,

said body having an opening of a first diameter to receive said alignment stud,

said stud being inserted therein,

said stud being of such size as to fit within a crane barrel to be extended,

said body opening having a larger diameter section into which said crane barrel may be inserted when mounted onto said stud,

said body having a stylus receiving threaded aperture communicating with said larger diameter section,

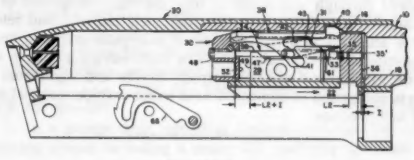
said stylus upon rotation in said aperture engaging the outer surface of said barrel, whereby rotation of said crane barrel about said stud causes said stylus to wear a groove about the outer barrel surface, thus causing said barrel to elongate.

4,344,246

FIRING PIN BLOCK FOR FIREARM HAVING A RECIPROCATING BREECH BOLT

Thomas G. Bauman, and Jack L. Kast, both of Ilion, N.Y., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Feb. 14, 1980, Ser. No. 121,436
Int. Cl.³ F41C *11/02*
U.S. Cl. 42—69 B **8 Claims**



1. A firearm including a receiver; a barrel secured to said receiver, and having a rearwardly-open breech; said firearm being formed with a locking recess;

a breech bolt reciprocable longitudinally in said receiver, and having a front face adapted to close said breech;

a locking block received in said bolt for longitudinal reciprocation therewith, said locking block being arranged for pivotal movement, transverse to the longitudinal recipro-

cation of said bolt, to and from a locked position engaged in said recess to lock said bolt to said firearm;

a firing pin received in said bolt for longitudinal sliding motion between a position retracted behind said bolt face and a position protruding forwardly therefrom, and having an enlarged abutment formed rearwardly thereon;

and a unitary slide block movable forwardly and rearwardly in said receiver; a rearward portion of said slide block being aligned with said abutment in the direction of longitudinal motion of said firing pin; said bolt being movable forwardly to close and arrest said bolt face against said breech by forward movement of said slide block into a first position, and movable rearwardly to open said breech by rearward movement of said slide block;

said slide block and said locking block being formed with mutually-engageable cam surfaces constructed and arranged for pivoting said locking block into full engagement with said recess in response to movement of said slide block relative to said bolt into a second position advanced forwardly from said first position, and for retracting said locking block from said recess in response to retracting movement of said slide block into said first position;

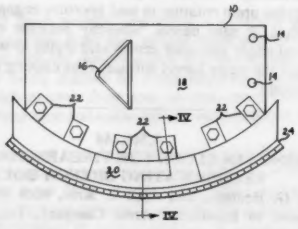
said rearward portion of said slide block extending rearwardly toward said abutment to a length effective, in said second position of said slide and all positions rearward thereof, to block any forward movement of said abutment sufficient to cause said firing pin to protrude forwardly of said bolt face.

4,344,247

OTTERBOARD

Benedick J. Howard, Toronto, and Emil Lill, Mississauga, both of Canada, assignors to Kennametal Inc., Latrobe, Pa.

Filed Jul. 27, 1977, Ser. No. 819,393
Int. Cl.³ A01K *73/045*
U.S. Cl. 43—9 **7 Claims**



1. An otterboard for use in trawling and comprising; a plate member with means thereon for connecting to a trawling net and also having means for connection to a tow line so as to be towed through the water, a shoe member comprised of an austenitic manganese wear resistant steel material and releasably attached to a bottom side of said plate member, and a substantially rectangular steel sole plate having a bottom side with longitudinal grooves formed therein and segmented inserts comprised of cemented hard metal carbide material held in said grooves.

4,344,248

AUTOMATIC HOOKSETTING FISHING ROD HOLDER

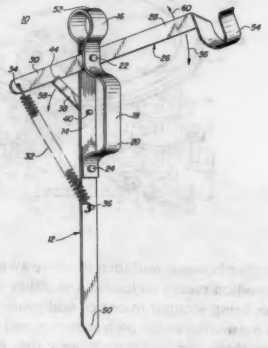
Hugh J. Brophy, Sr., and Hugh J. Brophy, Jr., both of 9 Garrison Ave., West Somerville, Mass. 02144

Filed Jun. 16, 1980, Ser. No. 159,929
Int. Cl.³ A01K *97/10*
U.S. Cl. 43—15 **1 Claim**

1. An automatic hooksetting fishing rod holder comprising:

a mounting member formed of a single continuous strap including a stake section, a first loop section at the top of said stake section for providing a handgrip for inserting and removing said stake section, and a return section extending from said first loop section along said stake section, pivot means carried by said mounting member and a second loop formed integrally in said strap below said pivot means for receiving a portion of the fishing rod handle;

a holder arm member pivotably connected to said mounting member at said pivot means and including a forward



portion extending on one side of said mounting member for engaging a fishing rod handle;

spring means interconnected between said mounting member and said holder arm member to urge said forward portion of said holder arm upwardly; and

latching means including a pawl pivotably attached to one of said members for restraining upward motion of said forward portion of said holder arm member until a downward force on said forward portion disengages said pawl and seat.

4,344,249

PLAY SET

Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91356, and Elonne Dantzer, 28030 Palos Verdes Dr. E., Rancho Palos Verde, Calif. 90274

Continuation-in-part of Ser. No. 11,445, Feb. 12, 1979, Pat. No. 4,227,340. This application Oct. 14, 1980, Ser. No. 196,839
Int. Cl.³ A63H *3/00*
U.S. Cl. 46—151 **1 Claim**

1. A play set comprising:

(a) a three-dimensional doll figure having a front surface which is contoured and bears indicia to represent the figure, said front surface having a peripheral edge;

(b) a plurality of flexible, resilient, three-dimensional pieces for releasably attaching to said doll figure, each of said pieces having a contoured portion for overlying a major portion of the contoured front surface of the doll figure, each of said pieces also including retaining means for engaging said peripheral edge to releasably attach the piece to the doll figure, said retaining means for each of

said pieces comprising a pair of spaced apart rearwardly extending portions that are positioned, when the piece is assembled on the doll figure, to interengage with said peripheral edge at opposite sides of the doll figure, each of said pieces and the associated engaging portions being integrally formed as a single molded plastic part that includes a three-dimensional representation of at least a portion of a limb of the doll figure,

said doll figure being hollow and comprised of a front section providing the contoured front surface and a rear section providing a generally flat rear surface,

said doll figure including an elongated collection of simulated hair protruding from either side of the head of the doll figure, said simulated hair collection being provided by a single elongated bundle of simulated hair, at least one of said sections being provided with an opening at either side for extension therethrough of said bundle,

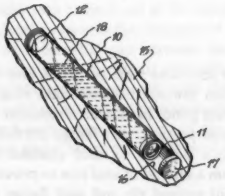
said play set further including means to retain said bundle in place, said retaining means comprising a band secured to an intermediate portion of said bundle, and a spaced apart pair of stop means on at least one of said sections and on opposite sides of said band each defining an opening large enough to receive the bundle therethrough but not large enough to receive the band therethrough.

4,344,250

METHOD FOR TREATMENT OF WOOD USING A REACTIVE CLOSURE MEANS TO PROVIDE A TIME DELAYED RELEASE OF THE TREATING AGENT

George B. Fahlstrom, Mission Viejo, Calif., assignor to Osmose Wood Preserving Co. of America, Inc., Buffalo, N.Y.

Filed Dec. 10, 1980, Ser. No. 215,034
Int. Cl.³ A01G *7/06*
U.S. Cl. 47—57.5 **16 Claims**



1. In a method of applying a chemical treatment agent to a wood structure wherein a hole is formed within the wood structure to be treated and a container enclosing the treatment agent is positioned within the hole such that the container is substantially confined and enclosed within the wood structure, the improvement characterized by:

(A) placing the treatment agent into a container having at least one open end, which container is fabricated out of a material which is essentially non-reactive when placed in contact with said treatment agent or the vapors of said treatment agent,

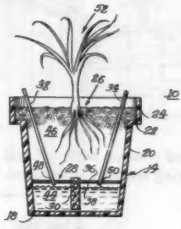
(B) sealing the open end of said container with a suitable closure means substantially fabricated out of a material which undergoes an interaction when contacted with said treatment agent or the vapors of said treatment agent, such that after a sufficient period of time has elapsed for the interaction to occur, an opening will spontaneously be provided through said closure means to permit the chemical treatment agent and vapors to pass out of said container and into the wood structure.

4,344,251

SELF-IRRIGATING POT FOR PLANTS

Robert J. Edling, Baton Rouge, La., assignor to The Board of Regents of the University of Nebraska, Lincoln, Nebr.

Continuation-in-part of Ser. No. 57,303, Jul. 13, 1979, abandoned. This application Jan. 23, 1981, Ser. No. 227,814
Int. Cl.³ A01G *25/00*
U.S. Cl. 47—80 **4 Claims**



1. A kit adapted to form an irrigator together with a standard horticultural pot, comprising:

a disc formed of material impermeable to water and having a diameter larger than the bottom inner diameter of standard pots and smaller than the inner diameter of the top of standard pots;

said disc having edges beveled to conform with the angle of the inner wall of standard tapered pots;

a central aperture in said disc;

a cylindrical ceramic porous material having an outer diameter substantially equal to the inner diameter of said central aperture;

a first radial aperture;

a first cylindrical tube having walls impermeable to water and an outer diameter substantially equal to the inner diameter of said first aperture;

a second cylindrical aperture radially offset from said central aperture of said disc;

a second cylindrical tube having walls impermeable to water and of substantially the same size as said second circular aperture;

said central ceramic plug having an outer diameter which is less than 30 percent of the outer diameter of said divider disc; and

said first tube having an outer diameter less than 5 percent of the outer diameter of said divider disc.

4,344,252

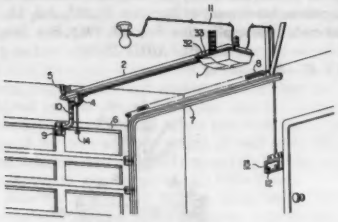
GARAGE DOOR OPERATION CONTROL APPARATUS

Mitsuo Suzuki; Takeshi Tokunaga; Seiji Yonekura; Shigeru Matsuoka, and Kenji Nakamura, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 28, 1980, Ser. No. 134,867
Claims priority, application Japan, Feb. 21, 1979, 54-19392
Int. Cl.³ E05F *11/00*
U.S. Cl. 49—199 **10 Claims**

1. In a garage door operation control apparatus having a driving system including a motor for operating the door between open and closed positions, a door stop position control system comprising: a switch operating member connected to said driving system through a transmission means so as to be moved in proportion to the amount of operation of said driving system, and a door stop switch operated at a predetermined door stop position in response to said switch operating member, said transmission means including means for releasing the interlocked relation between said driving system and said switch operating member, and said switch operating member

being supported in such a manner as to be movable to a position actuating said door stop switch under the condition where



the interlocked relation between said driving system and said switch operating member is released.

4,344,253

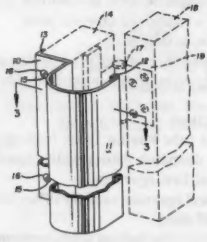
DOOR EDGE AND HINGE GUARD

Robert Stiles, 515 Fifth St., Niles, Ohio 44446

Continuation of Ser. No. 54,656, Jul. 3, 1979, abandoned. This application Mar. 9, 1981, Ser. No. 241,767

Int. Cl.³ E06B 7/28

U.S. Cl. 49—383 **4 Claims**



1. A door edge and hinge guard for attachment to a door frame and jamb to which one edge of a door is hinged, and comprising a cross sectionally U-shaped elongated body member having a half circular curved base section and spaced parallel arms extending therefrom, the ends of said arms lying on a common vertical plane, a right angular flange formed continuously on the end of one of said arms and outturned with respect to said U-shaped body member and means for attaching said right angular flange to said door frame and jamb so as to position said U-shaped body member in spaced relation to the hinged edge of said door with said half circular curved base section offset outwardly from said right angular flange and said door.

4,344,254

THERMALLY INSULATED ALUMINUM DOOR OR WINDOW FRAME

Giovanni Varlonga, Milan, Italy, assignor to Feal S.p.A., Milan, Italy

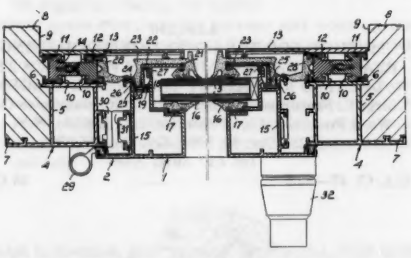
Filed Mar. 24, 1980, Ser. No. 133,058

Claims priority, application Italy, May 2, 1979, 21463/79[U]

Int. Cl.³ E05D 7/00; E06B 1/22

U.S. Cl. 49—401 **1 Claim**

1. A metal door or window frame comprising a fixed framework for its fixing to a rim contour of an opening in a wall of a room into which the door or window frame is to be mounted, a mobile framework for framing therein one or more panes of glass and the like and heat insulating gasket elements cooperating therewith, said rim contour lying in a plane of the opening, the frame having a width extension extending perpendicular to the rim contour of said opening and parallel to said plane and a depth extension extending perpendicular to said plane, wherein the fixed framework and the mobile framework are constituted by a fixed and a mobile subframe respectively, formed from a substantially tubular section arranged on that side of the frameworks facing the room interior, and a fixed and a mobile cover section respectively arranged on that side of the frameworks facing outwards, said gasket elements of heat insulating material being arranged between the subframes and the cover sections for providing an uninterrupted heat insulating barrier therebetween, at least some of said gasket elements having connection formations cooperating in the connection between the cover sections and the subframes, wherein said fixed cover section for the fixed subframe is substantially flat and extends parallel to said plane and substantially over the entire width extension of said frame and has profiled lugs in engagement with said connection formations of said gasket elements and arranged offset at a distance from said mobile cover section to provide a first interspace therebetween, when said mobile framework is in the closed position, and wherein said mobile cover section has a flange portion extending perpendicular to said width extension and a web portion extending parallel to said width extension when said mobile framework is in closed position and parallel to said panes, said web portion having an end zone overlapping an edge portion of said panes at a distance therefrom to provide a second interspace therebetween, said mobile subframe has on the side facing said mobile cover section a channel-shaped formation formed of a pair of spaced apart ribs extending from



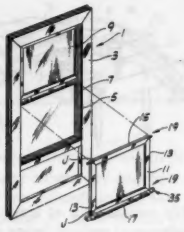
said mobile subframe side perpendicular to said web portion and a bottom portion between said ribs, a first of said ribs nearest to said panes having an abuttment edge in engagement with said web portion, said flange portion extending into the channel space defined by said channel formation and at a distance from a second of said ribs to provide a third interspace between said second rib and said flange portion, said flange portion having a nose formation on an end thereof facing said bottom portion and said first rib having a shoulder formation near said bottom portion adapted to engage said nose formation thereby said abuttment edge and said shoulder formation defining two spaced apart points of engagement between said mobile cover section and said mobile subframe, a channel shaped gasket element having a gasket web portion extending over said web portion of said mobile cover section and spaced apart gasket flange portions, one of said gasket flange portion being at a distance from said panes and inserted into said third interspace, the other of said gasket flange portions having an inwardly bent extension towards said channel defined space thereby to embrace said end zone of said web portion and be inserted into said second interspace in engagement with said edge portion of said panes, said gasket inwardly bent extension and said gasket flange portion having surface formation for a forcible insertion in said second and said third interspace thereby to firmly hold in position said mobile cover section in cooperation with said spaced apart points of engagement of said mobile cover section and to firmly hold in position said frames.

4,344,255

WINDOW SASH

Harold H. Knoll, Freeburg, Mo., assignor to Quaker Window Products Co., Freeburg, Mo.

Filed Aug. 18, 1980, Ser. No. 179,072
Int. Cl.³ E06B *3/00*
U.S. Cl. 49—501 **12 Claims**



1. A sash adapted to be received in an opening in a window or the like having channels constituting tracks for the sash at opposite sides of the opening, the sash comprising:

a pair of side members;

a pair of cross members; and

means for securing the side and cross members together at joints, said securing means comprising a pair of screws at the joints at the ends of a cross member of the sash, each screw having a threaded shank and a head of generally uniform circular section throughout its length, the shank extending through a hole in one of said side members and being received in threaded engagment in an opening in the end of said cross member, the head projecting laterally outwardly from the side member, having an inner face in engagement with the side member and means at its outer end adapted to be engaged by means for turning the screw, the head being adapted to extend for substantially its entire length within the respective track thereby enabling the window sash to be fitted in the window with its side members closely adjacent the channels of the window and thus with no substantial gap between the side members and the channels, and having its generally cylindrical outer surface in sliding engagement with the respective track thereby enabling both sliding movement of the sash in the tracks and swinging movement of the sash in the window opening about the outer surfaces of the heads of said screws.

4,344,256

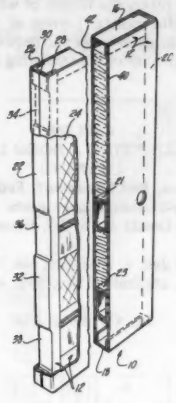
DOOR WITH VARIABLE HINGE LOCATIONS

Clarence H. King, Grosse Pointe Woods, Mich., assignor to Copco Door Company, Warren, Mich.

Filed Dec. 17, 1980, Ser. No. 217,476
Int. Cl.³ E06B *3/00*
U.S. Cl. 49—501 **11 Claims**

1. A door structure which accomodates hinges of a given length spaced at a wide variety of spacings on a door jamb, said door comprising:

a frame including at least one continuous hinge channel member having a major outer surface, a plurality of offset sections inboard of said major surface spaced along the length of said member, said offset sections being substantially longer than the length of said hinges and spanning the range of normally encountered locations of the hinges on the door jamb, front and rear skins connected to the frame, with edges of said skins being supported by the major surface of said member whereby segments of said skins in alignment with existing hinge locations may be



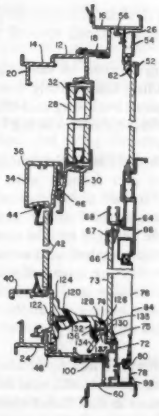
removed to expose selected portions of said offset sections for substantially flush mounting of the hinges.

4,344,257

WINDOW STRUCTURE

Richard N. Anderson, 1572 Oak Park Dr., Owensboro, Ky. 42301

Filed Jun. 21, 1979, Ser. No. 50,817
Int. Cl.³ E06B *1/04*
U.S. Cl. 49—504 **13 Claims**



1. Thermal break window structure including a generally rectangular outer frame portion, a generally rectangular inner frame portion, and an insulating member positioned between the inner and outer frame portions and cooperable therewith for rigidly securing the frame portions together without contact between the frame portions, said insulating member having a cross section including an elongated straight central portion extending transversely of the plane of the window structure, said insulating member extending through the frame parallel to the plane of the window only in off set locations separated by the extent of the elongated central portion of the insulating member and defined by the frame portions and said insulating member including an H-shaped portion at both ends

of the central portion having opposite parallel parts in common with the central portion and the frame members have a cross section including a pair of parallel spaced parts, one of which is longer than the other, the longer of which parts extend on opposite sides of the central portion of the H-shaped cross section of the insulating member and between the parallel parts of the H-shaped portions of the insulating member at the inner ends thereof.

4,344,258

DEVICE FOR MOUNTING A DOOR LEAF IN A DOOR OPENING

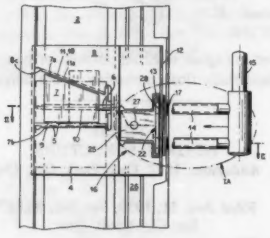
Günter Langenhorst, Bad Sassendorf, Fed. Rep. of Germany, assignor to Top-Element Bauelemente für Innenausbau & Raumgestaltung GmbH & Co. KG, Hamm, Fed. Rep. of Germany

Filed Jan. 6, 1981, Ser. No. 222,764

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1980, 3000454

Int. Cl.³ E06B *1/04*

U.S. Cl. 49—504 **10 Claims**



1. A door mounting device for a door leaf in a door opening of a wall having an edge turned toward said opening, said device comprising:

at least one mounting element on said edge having a clamping surface projecting transversely from said edge;

a profiled frame element enclosing said edge and said mounting element, said frame element being formed with a door rabbet;

a retainer disposed in said frame element in the region of said mounting element and formed with a counter-surface extending parallel to said clamping surface;

first clamping means in said frame element including a wedge displaceable relative to said retainer for clamping said clamping surface against said counter-surface, and a clamping screw traversing a wall of said rabbet, threaded directly into said wedge and rotatable to actuate said wedge, said retainer having an anchor flange extending transversely to said edge and provided with at least one recess;

a door-suspending member having at least one bolt passing through said frame element and said recess; and

second clamping means in said frame element operable by a further screw traversing a wall of said rabbet for locking said bolt.

4,344,259

ROCKER ARM AND PIN HOLDER ASSEMBLY FOR A LENS SURFACING MACHINE

Nestor E. Barolin, 39 Eight St., Hicksville, N.Y. 11801

Filed Jul. 21, 1980, Ser. No. 171,014

Int. Cl.³ B24B *13/02*

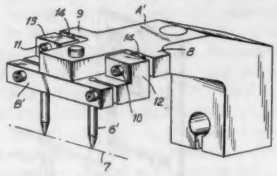
U.S. Cl. 51—216 LP **4 Claims**

1. In a rocker arm assembly for use in a lens grinding machine for producing toric lenses in which the rocker arm assembly includes a rocker arm that is movable relative to the lap axis of the lens grinding machine, the improvement comprising

said rocker arm having a planar projection with a flat face normally disposed substantially vertical and extending horizontally outward from the lateral sides thereof,

a support having a flat face normally disposed substantially vertical and extending horizontally in facing relationship with said flat faces of said rocker arm,

fastening means engaging said rocker arm and said support



for releasably maintaining at least the flat face of said support in substantial vertical facing with and to adjust the same in spaced relationship from the faces of said rocker arm and for adjustment of said support about an axis perpendicular to the plane of said rocker arm projection,

and a plurality of relatively spaced lens engaging means on said support.

4,344,260

METHOD FOR PRECISION SHAPING OF WAFER MATERIALS

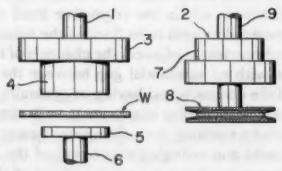
Kesami Ogiwara, Nagano, Japan, assignor to Nagano Electronics Industrial Co., Ltd. and Shin-Etsu Chemical Co., Ltd., both of, Japan

Filed Jul. 1, 1980, Ser. No. 165,191

Claims priority, application Japan, Jul. 13, 1979, 54-89146; Oct. 26, 1979, 54-138308

Int. Cl.³ B24B *1/00*

U.S. Cl. 51—283 E **1 Claim**



1. A method for shaping a wafer material with accurate dimensions from a single crystal rod which comprises the steps of

(a) grinding the single crystal rod so that the rod has a diameter 0.5 to 1.5 mm. larger than the finished wafer material as a grinding margin,

(b) slicing the single crystal rod into margined wafers, and

(c) subjecting the margined wafer to contour grinding tracing a prototype having a cross section exactly in conformity with the wafer material to be finished.

4,344,261

SKYLIGHT

Kent A. Weisner, Orlando, and Lester L. Walls, Jr., Deltona, both of Fla., assignors to Kennedy Sky-Lites, Inc., Orlando, Fla.

Division of Ser. No. 12,822, Feb. 16, 1979, Pat. No. 4,278,414. This application Jul. 14, 1980, Ser. No. 168,536

Int. Cl.³ E04B *7/18*

U.S. Cl. 52—200 **6 Claims**

1. A skylight comprising in combination:

a first dome having two step ledges around its perimeter and

a vertical portion adjacent one step extending substantially perpendicular to said step and connected to the central dome area;

a second dome having a perimeter sized to fit into one step formed in the perimeter of said first dome and adhesively attached thereto and having a central dome area extending into said first dome; and

a third dome having a perimeter sized to fit a second step of said first dome and adhesively attached thereto and having a dome portion extending into said second dome to form a triple dome skylight having two insulated air spaces.

4,344,262

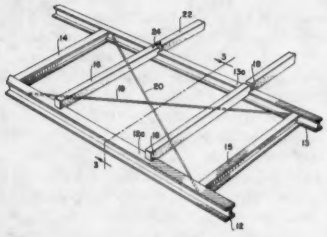
LONG SPAN STRUCTURAL FRAME

Herbert M. Berman, 300 E. 74th St., New York, N.Y. 10021, and Ira Hooper, 510 E. 23rd St., New York, N.Y. 10010

Continuation of Ser. No. 313,490, Dec. 8, 1972, abandoned. This application Aug. 12, 1976, Ser. No. 713,804

Int. Cl.³ E04C *3/02*

U.S. Cl. 52—227 **4 Claims**



1. A stable building structure comprising a plurality of horizontally disposed, spaced, structural members, each of said structural members being in an elevated position and secured to base supports; a series of spaced parallel beams extending transversely between adjacent pairs of said structural members and connected thereto so as to form a plurality of bays across a portion only of said structure, at least one truss member extending diagonally across each of said bays and means to connect the distal ends of said truss members to said adjacent pair of said structural members so as to form horizontal trusses; a plurality of parallel concrete joists supported by and transversely extending between said structural members, said joists being spaced from each other and from said parallel beams; each end portion of said joists engaging a structural member and adjacent end portions of said joists being tied together across said structural members or bonded to said structural members, so as to form continuous tension or compression ties which extend horizontally from said horizontal trusses across said building structure, including that portion of said building structure in which said bays have not been formed.

4,344,263

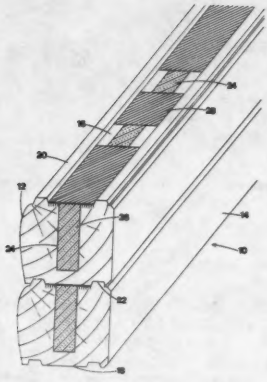
BUILDING LOG WITH HIGH THERMAL INSULATION CHARACTERISTICS

Johann H. Farmont, 433 Golden Gate Ave., Belvedere, Calif. 94920

Filed Jul. 28, 1980, Ser. No. 172,522

Int. Cl.³ E04B *1/10*

U.S. Cl. 52—233 **4 Claims**



1. A wood log of substantial thickness;

said log having complementary top and bottom surfaces adapted to stack with complementary surfaces on other logs;

one of said surfaces including:

a pair of parallel tongues formed thereon to extend along the length thereof adjacent the edges thereof; and

a planar surface between said tongue;

the other of said surfaces including:

a pair of complementary parallel grooves formed therein to extend along the length thereof adjacent the edges thereof to receive the parallel tongues of an adjacent one of stacked logs; and

a planar surface between said tongues;

at least one vertical slot along the length of said log;

each slot opening into one of said top and bottom planar surfaces;

thermal insulation material in each of said slots;

said slots extending through the major portion of the top to bottom thickness of said log; and

at least one metal reinforcing plate nailed to, and extending substantially across, said one planar surface along the length thereof to span said vertical slot.

4,344,264

FLEXIBLE CORNER SEAL STRUCTURE FOR CRYOGENIC CONTAINER

Dale A. Smith, Newport Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

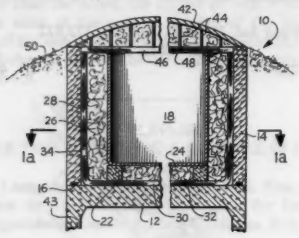
Filed Jun. 9, 1980, Ser. No. 157,789

Int. Cl.³ E04B *1/32*

U.S. Cl. 52—247 **15 Claims**

1. In a cryogenic container comprising a concrete floor slab, a concrete wall moveably supported on said floor slab, insulation positioned within the container adjacent the floor slab and the concrete wall; and a metal liner positioned around the inner surface of said container adjacent the inner surface of the floor slab and said concrete wall and supporting said insulation, and forming an inner seal around the container; the improvement which comprises providing said liner with an inclined lower portion at a corner above said floor slab, and means connecting said inclined lower portion at its upper end to said concrete wall at a predetermined distance above said floor slab, and

forming a gap between said liner and said concrete wall at said corner, and permitting inward lateral motion of said concrete



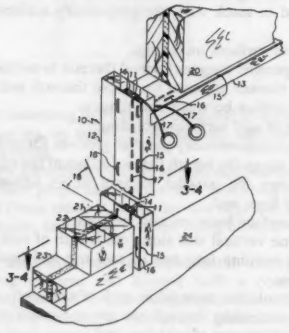
wall with respect to said floor slab at said corner, while permitting said metal liner and said insulation supported by said liner to flex and maintain a seal at said corner.

4,344,265

ENERGY CONSERVING BUILDING STRUCTURAL ELEMENTS NORMALLY CALLED WINDOW OR DOOR FRAMES

James D. Davidson, P.O. Box 1293, Pontiac, Mich. 48056

Filed Jul. 14, 1980, Ser. No. 168,594
Int. Cl.³ E02D *35/00*
U.S. Cl. 52—741 **6 Claims**



1. An improved energy conserving structural element normally used in combination with other structural components in a manner such that a relatively narrow air gap that should be thermally insulated is created between elements, said element comprising a structural member having thermal insulation means secured thereon the side therefore that will define the air gap, said insulation means comprising compressed expandable thermal insulation means having enveloping means retaining same in a compressed state, said enveloping retaining means being capable of being rendered inoperative so as to allow said insulation material to expand, said insulation material in its expanded state, having thickness to substantially fill said air gap,

wherein the improvement comprises:

means for recessing and enveloping said compressible expandable insulation into said structural elements outer periphery surface, said recess being used to substantially provide said envelope means;

means for maintaining said compressible expandable insulation in a compressed mode in said recess enveloping means; and

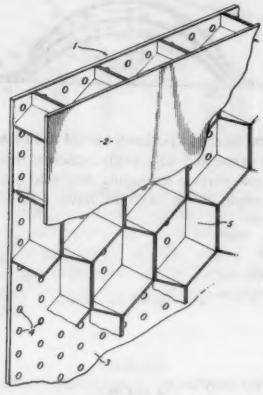
until said maintaining means is rendered inoperative.

4,344,266

COLLAPSIBLE STRUCTURE AND METHOD OF BUILDING USING SUCH A STRUCTURE

Paul D. Gray, Billericay, England, assignor to Magnex Limited, Douglas, Isle of Man

Continuation of Ser. No. 959,178, Nov. 9, 1978, abandoned. This application Aug. 15, 1980, Ser. No. 178,543
Int. Cl.³ B32B *3/12*
U.S. Cl. 52—742 **2 Claims**



1. A method of constructing a castable flooring atop subsoil subject to swelling when moistened comprising, providing a vertically collapsible composite board assembly including normally spaced apart upper and lower sheets having a separating structure of poor wet strength sandwiched therebetween, selecting said separating structure having a plurality of spaced apart components of sufficient initial dry strength to rigidly support said upper sheet in a manner spaced above said lower sheet and against the weight of a poured castable flooring during its setting period, said lower sheet allowing passage of moisture therethrough from said moistened subsoil to said spacing separating structure, laying said board assembly with said lower sheet over said subsoil, pouring a castable flooring atop said board assembly upper sheet whereby, following setting of said flooring, moisture from said subsoil penetrates said lower sheet causing disintegration and permanent collapse of said separating structure while allowing displacement of said lower sheet toward said upper sheet and into the space formerly occupied by at least a portion of said separating structure as said moistened subsoil swells upwardly.

4,344,267

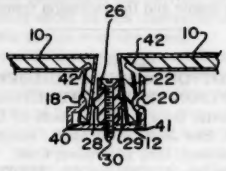
APPARATUS FOR JOINING WALL PANELS

Ronald D. Sukolics, St. Louis, Mo., assignor to Carl Dunmon & Associates, Inc., St. Louis, Mo.

Filed Apr. 10, 1980, Ser. No. 139,004
Int. Cl.³ E06B *3/54*
U.S. Cl. 52—762 **11 Claims**

1. An apparatus for joining panel members together comprising a channel having a substantially semi-cylindrical interlocking means extending from the inner walls of the sides into the channel for pivotally engaging a substantially semi-cylindrical interlocking means on the inner face of the turned down edges of panel members designed to be located side by side in said channel, insert means operable for insertion into said channel between the side-by-side edges of panels in said channel, and means protruding from the sides of said insert means

for wedging the edges of panel members into said interlocking means and allowing pivotal movement of edges of panel members positioned in said channel about said interlocking means thereby permitting thermal expansion of said panel members.

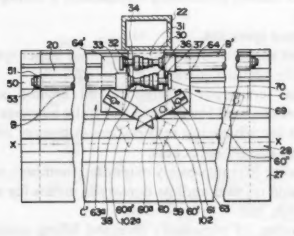


4,344,268

BAG SLITTING APPARATUS

Atsuyuki Wakamatsu, Shimizu, and Keisuke Tonooka, Shizuoka, both of Japan, assignors to Daiwa Can Company, Japan

Filed Oct. 23, 1980, Ser. No. 200,058
Claims priority, application Japan, Mar. 14, 1980, 55/33397
Int. Cl.[3] B65B *69/00*
U.S. Cl. 53—384 12 Claims



1. Apparatus for opening an elongated bag enclosing an article, said apparatus comprising:

(a) bag support means including structure defining an elongated, horizontally extensive groove open at the top to dispose a portion of the wall of a supported bag thereabove;

(b) means for engaging such portion of the bag wall adjacent the middle of the bag and pulling the engaged wall portion in a direction transverse to the longitudinal axis of the bag so that the engaged wall portion extends in such transverse direction away from the article enclosed in the bag;

(c) two blades; and

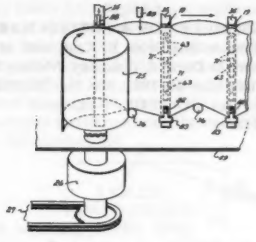
(d) blade movement means for forcing said blades through the wall of the bag adjacent the engaged wall portion thereof to puncture the bag and then moving said blades in opposite directions towards the ends of the bag to slit the wall of the bag, said blade movement means including a pair of carriages connected to said structure for movement relative thereto in direction generally parallel to said groove an disposed on the same side of said groove, means for moving each such carriage between a centered position in which such carriage is adjacent the middle of the groove and a displaced position in which such carriage is adjacent an end of said groove, said displaced positions being adjacent respective opposite ends of said groove, each of said blades being movably mounted to one of said carriages and disposed above said groove, and blade extension means for moving each of said blades relative to the associated one of said carriages between a retracted position in which such blade is remote from the vertical longitudinal medial plane of said groove and an extended position in which such blade is adjacent such medial plane, said blades being generally flat and disposed in horizontally extensive planes, each of said blades being pivotally mounted to the associated one of said carriages for movement relative thereto about a generally vertical blade pivot axis, said blade extension means being operative to swing each of said blades about the associated blade pivot axis.

4,344,269

POUCH FORMING AND FILLING MECHANISM WITH PROVISION FOR INCREASING THE CAPACITY OF THE POUCHES

Paul E. Dieterlen, Covington, Ky., and Harold T. Benner, Jr., Cincinnati, Ohio, assignors to R. A. Jones & Co. Inc., Covington, Ky.

Division of Ser. No. 914,426, Jun. 12, 1978, Pat. No. 4,232,504. This application Jul. 18, 1980, Ser. No. 169,944
Int. Cl.[3] B65B *1/06, 1/24*
U.S. Cl. 53—459 2 Claims



1. The method of filling a flexible pouch which has sealed lateral edges, a closed bottom and an open top, comprising the steps of,

supporting the lateral edges of the pouch in a generally vertical attitude,

reducing the width of the pouch by moving the lateral edges toward each other,

applying a force to the bottom of the pouch to form a tuck therein,

maintaining said force against the bottom of said pouch to hold the tuck in the pouch,

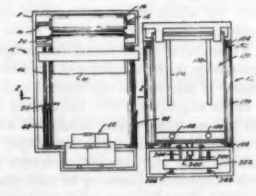
and filling the pouch while said force is maintained against the bottom of said pouch in the bottom of the pouch.

4,344,270

METHOD AND APPARATUS FOR PACKAGING COMMODITIES

Sture Andersson, Borås, Sweden, assignor to Tex Innovation AB, Vastra Frolunda, Sweden

Continuation of Ser. No. 73,340, Sep. 7, 1979, abandoned. This application Jun. 18, 1981, Ser. No. 274,738
Claims priority, application Canada, Sep. 11, 1978, 311069
Int. Cl.[3] B65B *9/14, 31/04*
U.S. Cl. 53—511 4 Claims



1. Apparatus for packaging and sealing a commodity in a bag

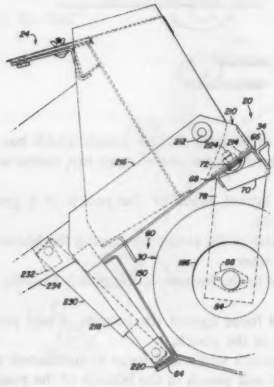
comprising: a packaging unit and a vacuum packaging and sealing unit; the packaging unit having a support bed, the support bed comprising an endless belt; means on one side of the belt for storing a supply of tubing; a commodity loading funnel fixed on the other side of the belt, reciprocating means for opening up the leading end of the tubing and for drawing a length of the tubing in one direction across the belt from the one side to the other side and over the funnel so that a commodity can be loaded into the tubing on the belt through the funnel, the reciprocating means having means thereon to cut and seal the length of tubing at the one side of the belt to form an open-mouth bag, means for moving the belt in a direction transverse to the one direction to laterally transfer the commodity loaded bag from the packaging unit to the vacuum packaging and sealing unit, the vacuum packaging and sealing unit having a support bed to receive the commodity loaded bag, means on the packaging and sealing unit movable in one direction for use in opening up the mouth of the bag, separate means movable in a second direction to enter the open mouth of the bag and to tension it, and means to vacuum seal the bag.

4,344,271

HEAD ASSEMBLY FOR A COTTON HARVESTER

Francis E. Schlueter, and Brian E. Kent, both of Des Moines, Iowa, assignors to Deere & Company, Moline, Ill.

Filed May 26, 1981, Ser. No. 266,875
Int. Cl.³ A01D *55/26, 46/08*
U.S. Cl. 56—13.6 **25 Claims**



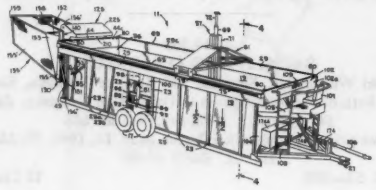
1. In a framed crop harvester adapted for forward movement over a field of row crops, a transverse harvesting head assembly comprising: a main cross auger frame supported by the harvester frame and having first and second transversely spaced ends; first and second bearings supported by the main cross auger frame adjacent the first and second ends, respectively; a main cross auger journalled for rotation about a generally horizontal axis by the bearings between the first and second ends; a transverse extension frame selectively attachable to and removable from the second end of the main cross auger frame; means for releasably securing the extension frame to the second end and extending the width of the harvesting head assembly beyond the width of the main cross auger frame; a third bearing supported by the extension frame adjacent its outermost end; a transverse auger extension; means for journalling the auger extension in the second and third bearings, when the extension frame is secured to the second end, for rotation with the main cross auger; and row harvesting means selectively attachable to, and transversely adjustable with respect to the main cross auger frame and extension frame, wherein the main frame includes row unit support structure and the row harvesting means comprises a plurality of individual vertically adjustable row units slidably supported by the unit support structure for transverse adjustment to accommodate different row spacings, and wherein the extension frame includes complementary support means for forming an extension of the unit support structure, when the extension frame is attached, and permitting the row units to be slid transversely between the main cross auger frame and the extension frame.

4,344,272

COMBINED COTTON MODULE BUILDER AND SEED COTTON TRASH EXTRACTOR

Andrew J. Gaudette; Dave A. Dana, both of Livermore, and Donald Haney, San Jose, all of Calif., assignors to Cotton Machinery Company, Inc., Livermore, Calif.

Filed Sep. 4, 1980, Ser. No. 184,078
Int. Cl.³ A01D *61/00*
U.S. Cl. 56—16.6 **27 Claims**



1. In seed cotton processing equipment, a lifting conveyor comprising:

(a) an upper sprocket;

(b) a lower sprocket disposed below said upper sprocket in a generally vertical plane;

(c) endless conveyor means trained around said upper sprocket and said lower sprocket to be advanced thereby;

(d) means for advancing said endless conveyor means by at least one of said sprockets;

(e) a plurality of transversely extending members mounted in succession on said endless conveyor means for movement therewith; and

(h) a plurality of outwardly directed lifting members projecting from each of said transverse members for lifting seed cotton to be carried by said lifting conveyor; and

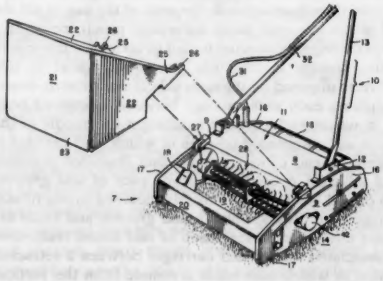
(i) a hopper in which seed cotton is deposited, said hopper including angularly disposed walls directing the seed cotton deposited therein toward said lifting conveyor.

4,344,273

LAWN SCARIFIER AND RAKE

Alan V. Jobling, Reading, and David J. Crisp, London, both of England, assignors to Black & Decker Inc., Newark, Del.

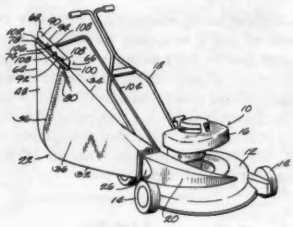
Filed Aug. 22, 1980, Ser. No. 180,463
Int. Cl.³ A01D *35/12*
U.S. Cl. 56—16.7 **24 Claims**



1. A lawn device, comprising:

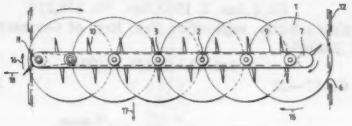
a carriage supported for movement over a lawn;
a handle connected to the carriage and by which the device is manipulated over the lawn by an operator;
a motor supported by the carriage;
a tine assembly mounted in said carriage for rotation therein by said motor about an axis transverse to the direction of travel of the device over the lawn;
said tine assembly comprising a central axle, a plurality of rods supported by and radially spaced from said axle, and a plurality of tine members carried by each rod and defining a cylindrical configuration in use;
said tine members each comprising a portion encircling its respective rod and a tine extending outwardly from said portion, whereby each said tine is deflectable relative to its respective rod; and
said rods being symmetrically and helically positioned about said axle, whereby in use the helix arrangement contributes to a more constant torque resistance to the rotation of said tine assembly by causing the tines along each individual rod to successively engage the lawn.

4,344,274
GRASS CATCHER BAG
Richard A. Heismann, Knoxville, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed Oct. 16, 1980, Ser. No. 197,484
Int. Cl.³ B65D *33/16*
U.S. Cl. 56—202 **10 Claims**



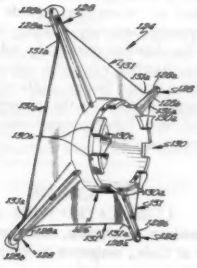
1. A grass collection bag comprising an elongated main body portion having a first access opening adapted for connection to a grass discharge outlet of a lawn mower and means defining a generally elongated second access opening having a pair of adjacently spaced first and second side edges extending at an angle to the length of the bag and having corresponding first and second ends, a first end panel having a first edge portion connection along a first fold line to said first side edge of said main body portion and a second edge portion extending outwardly from said main body portion and from adjacent to said first end of said first side edge, said first end panel being foldable upon itself along a second fold line extending from said first end of said first said edge to bring said second edge portion into a position overlying said first edge portion, a second end panel having a first edge portion connected along a third fold line to said second side edge of said main body portion and a second edge portion extending outwardly from said main body portion and from adjacent to said first end of said second side edge, said second end panel beiang foldable upon itself along a forth fold line extending from said first end of said second side edge to bring said second edge portion thereof into a position overlying said first edge portion thereof, means joining said second edge portions of said first and second end panels along a folding junction leaving an outer end remote from said first ends of said first and second side edges, and closure means on said main body portion, on said first end panel, and on said second end panel for folding each of said first and second end panels upon itself to bring said junction of said second edge portions of said first and second end panels into a position overlying and closing said second access opening and with said outer end of said junction located in adjacent relation to said second ends of said first and second side edges.

4,344,275
MUSHROOM HARVESTING MACHINE
Wilhelmus G. M. Kateman, 5, Hoogriebroekseweg, 5088 AA Oirlo, Netherlands
Filed Jan. 8, 1981, Ser. No. 223,323
Claims priority, application Belgium, Jan. 11, 1980, 881104
Int. Cl.³ A01D *45/00*
U.S. Cl. 56—327 R **5 Claims**



1. Mushroom harvesting machine, characterized in that it is provided with rotary knives which are positioned in stepped formation sequentially one below the other and with an upright conveyor belt provided with carriers, and wherein said upright conveyor belt is provided above said rotary knives and disposed substantially in line therewith, and said carriers are disposed spaced above and substantially upright from the rotary knives so that said carriers and the stepped rotary knives can transport the mushrooms.

4,344,276
GRAIN PICKUP
Lloyd P. Sund, Newburg, N. Dak. 58762
Continuation-in-part of Ser. No. 127,093, Mar. 4, 1980, abandoned. This application May 8, 1981, Ser. No. 261,982
Int. Cl.³ A01D *89/00*
U.S. Cl. 56—364 **3 Claims**



1. In a grain pickup for picking up windrowed grain for conveyance into a combine, the improvement comprising:
a driven rotating cylinder located transversely at the front of said pickup;
a plurality of plastic pickup teeth modules mounted on said cylinder, each of said modules comprising:
a cylindrical portion having two ends and a bore sized to snugly fit over said cylinder;
a plurality of integrally molded pickup teeth projecting radially outwardly from said cylindrical portion with said cylindrical portion having a thickness relatively thin compared to the diameter of said driven of said driven cylinder, each of said cylindrical portion ends having interlocking castellations thereon; and
a plurality of integrally molded web portions extending radially outward from said cylindrical portion between

said pickup teeth and in the plane thereof said web portions being thinner than said teeth and terminating radially inwardly of the outward ends of said teeth; and

means for preventing movement of said modules relative to said cylinder.

4,344,277

METHOD AND APPARATUS FOR CONNECTING AN UPPER THREAD WITH A LOWER THREAD

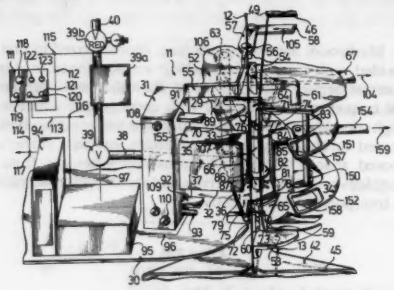
Joachim Rohner; Heinz Zumfeld, and Reinhard Mauries, all of Mönchengladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Mönchengladbach, Fed. Rep. of Germany

Filed Jun. 2, 1980, Ser. No. 155,219

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1979, 2922694

Int. Cl.³ D01H *15/00*

U.S. Cl. 57—22 **25 Claims**



1. Method for connecting an upper thread to a lower thread, which comprises inserting the threads into a longitudinal groove formed in a chamber for connecting the threads with a thread feeder being movable from a thread receiving position to a thread delivery position, splicing the threads together in the chamber using compressed air acting on the threads from the side, securely holding the threads up to the application of the compressed air when the threads are inserted into the chamber uncrossed, securely holding the threads which are inserted into the chamber during the splicing in the immediate vicinity of the chamber when the threads are crossed during movement of the thread feeder, elastically pressing the threads against the outer surface of the chamber and wrapping the threads around rims of the groove formed in the chamber at an angle of approximately 90°.

4,344,278

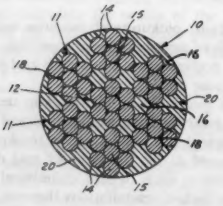
LUBRICATED WIRE ROPE

Warren E. Jamison, Evergreen, and James J. McVeigh, Lakewood, both of Colo., assignors to Projected Lubricants, Inc., Denver, Colo.

Filed May 30, 1980, Ser. No. 155,156

Int. Cl.³ D07B *1/10, 1/16*

U.S. Cl. 57—221 **6 Claims**



1. A wire rope comprising a plurality of strands of wire rope elements wound around a core, and a lubricant, characterized in that said lubricant comprises a polymeric lubricating medium having a carrier and a lubricant incorporated therein such that said lubricant is expelled from said medium when compressive forces are applied to said medium by said strands of wire rope during use of said rope, and said lubricant is drawn back into said medium when said compressive forces are removed from said medium.

4,344,279

HOLLOW STRINGS CONTAINING GELATINOUS OIL

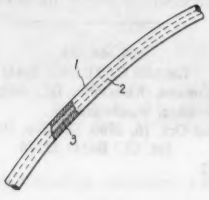
Tamanosuke Ohara, 254 Yura Yuracho, Sumoto-city, Hyogo-Prefecture, Japan

Filed Jul. 9, 1980, Ser. No. 167,214

Claims priority, application Japan, Jul. 13, 1979, 54/89628

Int. Cl.³ D02G *3/36;* D01H *13/30;* D02G *3/40, 3/44*

U.S. Cl. 57—232 **4 Claims**



1. A hollow string comprising a hollow core containing gelatinous oil and a wrapping thread helically wound thereabout, said hollow core being a hollow cavity through the central portion of said string, substantially along the whole length thereof and said gelatinous oil being a cyclic hydrocarbon of the formula C_nH_{2n-2} and being of high viscosity with a melting point of 30° C. or higher and fluidity at a temperature of 50° C. or higher, said gelatinous oil exhibiting a gel-like consistency at normal temperature.

4,344,280

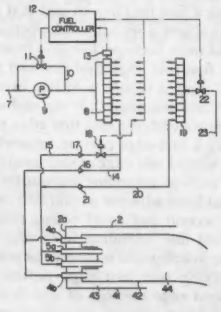
COMBUSTOR OF GAS TURBINE

Yoshimitsu Minakawa; Yoji Ishibashi; Isao Sato; Yoshihiro Uchiyama, and Kazuyoshi Takahashi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 24, 1980, Ser. No. 114,970

Int. Cl.³ F23R *3/34;* F02C *7/22*

U.S. Cl. 60—39.09 F **14 Claims**



1. A combuster of a gas turbine comprising:

fuel distributing and supplying means including:

a plurality of fuel nozzles provided to said combustor; and

a plurality of fuel supply systems connected to said plurality of fuel nozzles, each of said fuel supply systems supply

fuel to one fuel nozzle or a set of fuel nozzles, the number of the fuel supply systems for handing fuel being increased or reduced depending on the volume of fuel,

said combustor being one of a plurality of combustors of said gas turbine comprising a fuel distributor for distributing fuel in equal volume to all the combustors, and wherein said plurality of fuel supply systems of said fuel distributing and supplying means of each combustor are connected to said distributor so that the fuel supply systems of all the combustors can be actuated simultaneously, and

wherein said fuel distributing and supplying means further includes a purging air supply system for supplying air to the fuel nozzles and the fuel supply system which is handling no fuel, and further comprising

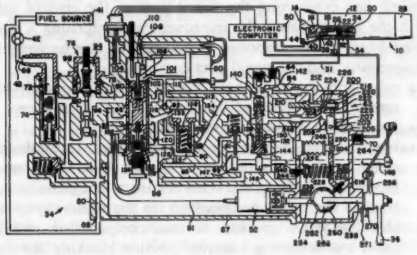
purging air pressure control means provided to said purging air supply system which is handling purging air to follow up the pressure in the fuel supply system which is handling fuel.

4,344,281

MANUALLY OPERATED METERING VALVE FOR A FUEL CONTROL

Robert W. Schuster, and Gerald C. Mittendorf, both of South Bend, Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Apr. 7, 1980, Ser. No. 137,659
Int. Cl.³ F02C *9/08*
U.S. Cl. 60—39.28 R **14 Claims**



1. In a fuel control having an operational metering valve through which fuel is scheduled from a source to an engine in response to an electrical input signal and a transfer valve activated by an operator during a back-up operational condition in the absence of said electrical input signal to manually schedule fuel to the engine, the improvement comprising:

a back-up metering valve having a housing with a first chamber and a second chamber therein, said first chamber having a first port connected to said source of fuel and a second port connected to said engine, said second chamber having a third port connected to said engine for receiving an operational signal corresponding to the discharge pressure of a compressor in the engine; and

lever means responsive to said operational signal for limiting the flow of fuel through the first chamber to the engine as a function of compressor discharge to prevent surging during acceleration in response to a manually applied operational input.

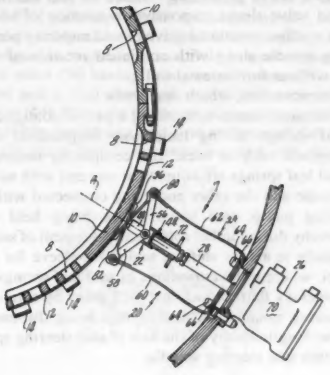
4,344,282

COMPRESSOR BLEED SYSTEM

Larry E. Anders, Palm Springs, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 16, 1980, Ser. No. 217,071
Int. Cl.³ F02C *3/06*
U.S. Cl. 60—226 R **4 Claims**

1. A fan engine having a core engine with a fan duct thereabout, said core engine having a compressor section with a compressor housing, a plurality of compressor bleed ports located in said compressor housing around a circumference thereof, a seal strap positioned around said compressor section aligned with said bleed ports, said seal strap being movable between an open position where it is spaced from said bleed ports and a closed position where it is placed against said bleed ports, an actuating means for said seal strap being positioned between said compressor housing and said fan duct, one end of said seal strap being forked, the other end of said seal strap



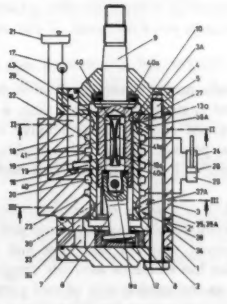
being a single member sized to fit between said forked end, a U-shaped flexible member, means connecting the bottom of said U-shaped flexible member to the interior of said fan duct, one leg of said U-shaped flexible member having its end attached to the forked end of said seal strap, the other leg of said U-shaped flexible member having its end attached to the single member end of said seal strap, said U-shaped flexible member biasing said seal strap to its open position, actuating means for moving said seal strap to its closed position.

4,344,283

HYDROSTATIC AUXILIARY POWER STEERING

Karl-Heinz Liebert, Schwabisch Gmund; Werner Tischer, Bobingen, and Christoph Deppenbrock, Schwabisch Gmund, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

Filed May 7, 1980, Ser. No. 147,601
Claims priority, application Fed. Rep. of Germany, May 11, 1979, 2919051
Int. Cl.³ B62D *5/08*; F15B *13/04*
U.S. Cl. 60—384 **9 Claims**



1. In a device of the kind described having a housing with flow passage means controlled by a valve means comprising a

valve sleeve, and a steering spindle coaxial with the valve sleeve, including means operative for axially shifting said valve sleeve responsive to spindle rotation bidirectionally for flow control to pressurize and exhaust chambers of a servomotor, and further including a metering pump articulated to said steering spindle; and having actuator means for return to neutral position of said valve sleeve wherein said metering pump initially holds said actuator means against return movement of said valve sleeve permitting rotation of said steering spindle and said valve sleeve responsive to rotation of said steering spindle to effect rotational drive of said metering pump by said steering spindle along with continued rotation of said valve sleeve without further axial shift;

the improvement which comprises:

said actuator means comprising a pair of contiguous arched leaf springs having lengthwise longitudinal curvatures disposed back to back, and comprising means whereby said leaf springs are coupled at one end with said steering spindle and the other end being connected with said metering pump, said valve sleeve being held stationary thereby during initial rotational movement of said steering spindle in axially shifting said valve sleeve for flow control; wherein the curvatures of said leaf springs are compressively flattened against each other by rotation of said steering spindle; said leaf springs being disposed lengthwise longitudinally of the axis of said steering spindle and within said steering spindle.

4,344,284

HYDRAULIC AUXILIARY POWER STEERING

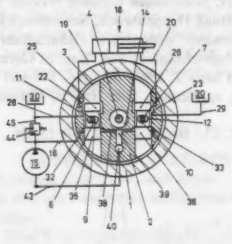
Armin Lang, Schwabisch Gmund, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

Filed Jan. 22, 1980, Ser. No. 114,389

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1979, 2903988

Int. Cl.³ B62D *5/08*; F15B *13/04*

U.S. Cl. 60—433 **10 Claims**



1. In a hydraulic power steering system of the kind described having a suction regulatable pump, a tank, a servomotor and actuatable inlet and exhaust control valve means, including respective flow passage means, all operable for controlling pressure and return flow for pressurizing and exhausting said servomotor;

wherein said flow passage means comprises inlet flow feed means communicable between pump and said tank;

the improvement wherein said inlet and exhaust control valve means has elements movable therewith controlling inlet flow to the suction side of said pump whereby said pump effects no output for pressurizing said servomotor until said valve means is actuated for steering and wherein continuous increase of pump inlet flow is effected during a steering actuation of said valve means.

4,344,285

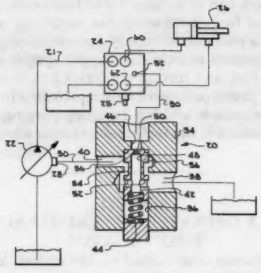
SIGNAL BLEED-DOWN VALVE

William A. Ridge, Inman, Kans., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed Feb. 4, 1980, Ser. No. 118,254

Int. Cl.³ F04B *49/08*; F15B *13/04*

U.S. Cl. 60—452 **6 Claims**



1. A load responsive system including a variable displacement pressure flow compensated pump supplying a directional control valve which in turn supplies one or more motors, the compensator of the pump is controlled by a signal through a sensing line connecting the signal port of the control valve with the compensator, the improvement comprising a signal bleed-down valve positioned in said sensing line between the compensator and the signal port comprising:

a valve body having a bore therein with the control valve sensing line connected to the upper end of the bore;

a drain cavity intersecting said bore;

valve spool means positioned in the bore; spring-biasing means urging the spool means against signal line pressure in the upper end of the bore toward a first position connecting the pump compensator to the drain cavity and blocking signal pressure to said compensator; and the spool means having a second position blocking the compensator from drain and communicating signal pressure to the compensator; and

a fixed orifice in the valve spool means passing pilot flow from the signal port to said drain cavity and a variable orifice in the valve spool means downstream of the fixed orifice which maintains a constant flow across the fixed orifice regardless of signal pressure.

4,344,286

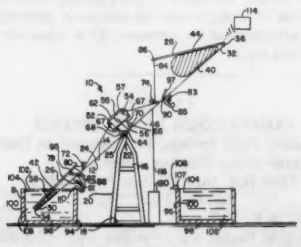
ENERGY CONVERTER MACHINE

Norman S. Warner, Apartado 118, Heredia, Costa Rica

Filed Apr. 10, 1980, Ser. No. 139,057

Int. Cl.³ F03C *5/00*

U.S. Cl. 60—531 **6 Claims**



1. An energy convertor machine which comprises:

(a) a see-saw device having a stand with an elongated member centered balanced on said stand;
(b) two sets of elastomeric bag members, each said set having at least one of said elastomeric bag members;
(c) a liquid having a low vaporization temperature, said liquid being disposed in each of said elastomeric bag member, one said bag members affixed to one end of said elongated member, the other said bag members affixed to another end of said elongated member;
(d) a means for selectively independently heating and cooling each said set of said elastomeric bag members thereby causing expansion of said elastomeric bag members when heated and causing contraction of said elastomeric bag members when cooled, said means for heating and cooling including a pair of tank members, each of said pair of tank members including a fluid disposed therewithin;
(e) said heating of one of said sets of said elastomeric bag members occurring simultaneously with said cooling of said other set of said elastomeric bag members; and
(f) means for pivoting said elongated member, said pivoting means being activated by said expansion and contraction of said elastomeric bag members, said means for pivoting including a movable object movably disposed on said elongated member, said movable object movable between two said bag members on an upper surface of said elongated member, means for controlling the movement of said movable object of said elongated member, said controlling means being in communication with said cooling and heating means, said ends of said elongated member alternately moving upwardly and downwardly as said movable object moves between said bag members on said elongated member, and an elongated rod member affixed to said elongated member, a dolly member having a body with a chamber therein, a plurality of bearing members affixed to said body, at least two axle rods journalled for rotation through said bearing members, a plurality of wheel members, said wheel members being affixed onto said axle members, a track assembly having at least two rails, said track assembly affixed on said upper surface of said elongated member, said wheels of said dolly member movably disposed on said rails of said track assembly, a pair of elongated elements, one said elongated element hinged to one end of said elongated member and engaging an upper surface of one of said bag members, the other said elongated element hinged to the other end of said elongated member and engaging an upper surface of the other bag member, a pair of pulley elements mounted on said upper surface of said elongated member, one of such pulley elements disposed between said first bag member and one end of said track assembly, the other said pulley element being disposed between said second bag member and said other end of said track assembly, a pair of pulley members mounted on such upper surface of said elongated member, one of said pulley members disposed between said first pulley element and said one end of said track assembly, the other said pulley member being disposed between said second pulley element and said other end of said track assembly.

4,344,287

VOLUME COMPENSATION FOR HYDRAULIC CIRCUITS

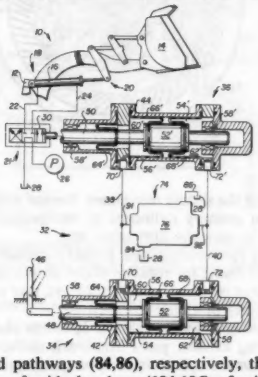
Ernest C. Sindelar, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 99,135, filed Aug. 23, 1979, as PCT/US79/06645, § 102(e) date Aug. 23, 1979, § 371 date Aug. 23, 1979, published Mar. 5, 1981 as WO 81/00599, now abandoned. This application Aug. 28, 1980, Ser. No. 182,293

Int. Cl.³ F15B 7/10

U.S. Cl. 60—572 **7 Claims**

1. A hydraulic circuit (32), comprising:
a tank (28);
first, second, third and fourth pathways (38,40,84,86), said third and fourth fluid pathways (84,86) being positioned in fluid communication with said tank (28) and being positionable in fluid communication with said first and second fluid pathways, respectively;
first means (34) for receiving an input signal and controllably passing a predetermined fluid pressure signal through one of said fluid pathways (38,40) in response to said input signal;
second means (36) for receiving said fluid signal in said one of said fluid pathways (38,40) and automatically, controllably delivering an output signal corresponding to said input signal in response to said fluid pressure signal; and
a control valve (76) having flow control means (98) including first and second check valves (100,102) each having a chamber (104,106), said flow control means automatically, controllably positioning said first and second fluid pathways (38,40) in fluid communication with said third and



fourth fluid pathways (84,86), respectively, through the related one of said chambers (104,106) of said first and second check valves (100,102), respectively, in response to said first and second fluid pathways (38,40) being free from said fluid pressure signal and automatically, controllably blocking said second and fourth fluid pathways (40,86) from fluid communication one with the other through their related one of the chambers (104,106) in response to said fluid pressure signal passing in said second fluid pathway (40) and acting on said flow control means (98) and automatically, controllably blocking the first and third fluid pathways (38,84) from fluid communication one with the other through their related one of the chambers (106,104) in response to said fluid pressure signal passing in said first fluid pathway (38) and acting on said flow control means (98).

4,344,288

INTERNAL COMBUSTION ENGINE

William C. Heaton, 150 E. Ponce de Leon Ave., Decatur, Ga. 30030

Filed Jun. 9, 1980, Ser. No. 157,517

Int. Cl.³ F02B 71/06

U.S. Cl. 60—595 **8 Claims**

1. An internal combustion engine comprising:
a frame;
a piston housing mounted on said frame, said piston housing defining a first primary cylinder and a second primary cylinder therein parallel to one another;
a first double acting piston means and a second double acting piston means slidably positioned within said first and second primary cylinders, respectively; each of said piston means including:
a primary double acting piston slidably movable within said primary piston cylinder and defining a secondary piston cylinder therein;
a secondary double acting piston slidably movable within

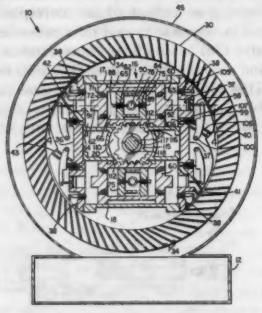
said secondary piston cylinder parallel to the movement of said primary piston;

means for conducting vaporized fuel into said secondary piston cylinder, said fuel being compressed by said secondary piston;

means for conducting said pressurized fuel from said secondary piston cylinder into said primary piston cylinder; and

means for igniting fuel in said primary piston cylinder;

means interconnecting said first and second piston means for



limiting the sliding movement thereof within said first and second primary cylinders to recriprocation at the same speed in opposite directions; and

a turbine surrounding said primary cylinders and mounted on said frame for rotation about an axis at right angles to the plane of said primary cylinders, said turbine including a plurality of vanes;

said housing defining exhaust openings therein alternately directing exhaust gases from each of the ends of each of said primary cylinders to impinge upon the vanes of said turbine and cause rotation thereof.

4,344,289

TWO-STAGE SUPERCHARGING APPARATUS

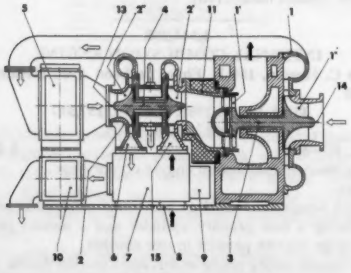
Georg Curiel, Wettingen, and Moustafa M. Naguib, Nussbaumen, both of Switzerland, assignors to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Filed Feb. 11, 1980, Ser. No. 120,482

Claims priority, application Switzerland, Feb. 19, 1979, 1609/79

Int. Cl.³ F02B *37/00*

U.S. Cl. 60—612 **13 Claims**



1. A supercharger for an internal combustion engine comprising:

a high-pressure compressor and turbine arranged on a first axis, the high-pressure turbine being directly driven by exhaust gas from an internal combustion engine;

a low-pressure compressor and turbine arranged on a second axis, the low-pressure turbine being driven by exhaust from the high-pressure turbine;

the low-pressure compressor and turbine has greater exterior dimensions than the high-pressure compressor and turbine; and

the first axis being arranged radially offset from the second axis such that the exterior dimensions of the high-pressure compressor and turbine will be substantially within an extension of the exterior dimensions of the low-pressure compressor and turbine.

4,344,290

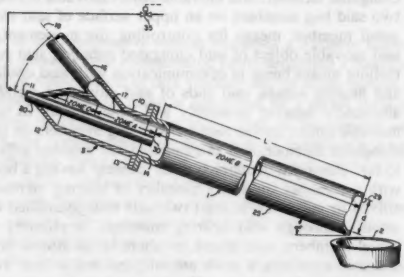
PROCESS AND APPARATUS FOR IN-LINE SLUSH MAKING FOR CONCRETE COOLING

John F. Boyle, Emmaus; Barry J. Halper, Allentown; James C. Link, Bethlehem, and John C. Mullane, Jr., Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 24, 1981, Ser. No. 295,939

Int. Cl.³ F17C *11/00*

U.S. Cl. 62—48 **12 Claims**



1. In an apparatus for producing a flowable liquid-solid mixture comprising a continuous liquid phase mixed with a discrete, discontinuous solid phase of frozen particles of the liquid, which apparatus comprises a manifold having a body portion having at one end thereof a sealed head and at the other end an opening, first inlet adjacent to the sealed head to receive a liquid, a second inlet in sealing engagement with the sealed head and having its longitudinal axis substantially aligned with that of said body portion for introducing a cryogen within said manifold downstream of said first inlet; and a hollow lance having its longitudinal axis substantially aligned with that of said body portion and having an open end connected to the opening of said body portion and an outlet at its other end to discharge the liquid-solid mixture,

the improvement which comprises said first inlet being connected to said body portion so that its longitudinal axis is at an acute angle with respect to the longitudinal axis of said second inlet.

4,344,291

CRYOGENIC CABINET FREEZER

Lewis Tyree, Jr., 145 Briarwood Ave. N., Oak Brook, Ill. 60521; James R. Missig, Joliet, and George D. Rhoades, LaGrange, both of Ill., assignors to Liquid Carbonic Corporation, Chicago, Ill., by said James R. Missing and George D. Rhoades

Filed Apr. 28, 1980, Ser. No. 144,594

Int. Cl.³ F25D *25/00*

U.S. Cl. 62—62 **16 Claims**

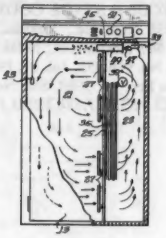
1. A method of refrigerating product within a first vertically extended cooling region, which method comprises

employing fan means to establish a primary circulation of gas throughout said first region,

expanding liquid CO_2 through orifice means having inducer

means with a substantially completely open flared entrance located in generally surrounding relationship to said orifice means so that the expanding liquid creates CO_2 snow and vapor and induces a secondary circulation of gas within said first region that effects rapid sublimation of the snow created plus distribution of the cold vapor throughout said cabinet,

said fan means being located so as to cause a flow of gas



through said inducer means even when liquid CO_2 is not being expanded,

sensing the temperature within said cabinet,

modulating the continuous flow of liquid CO_2 through said orifice means in response to changes sensed in the temperature, and

removing CO_2 vapor from said cabinet, whereby efficient cooling of said product is accomplished without build-up of CO_2 snow at the bottom of said first region.

4,344,292

PROCESS FOR HEAT PRODUCTION BY MEANS OF A HEAT PUMP OPERATED WITH A SPECIFIC MIXTURE OF FLUIDS AS THE WORKING AGENT

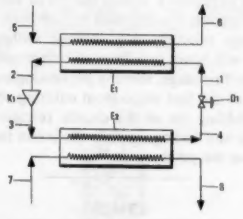
Alexandre Rojey, Garches, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jan. 21, 1981, Ser. No. 226,984

Claims priority, application France, Jan. 21, 1980, 80 01371

Int. Cl.³ F25B *00/00*

U.S. Cl. 62—114 **17 Claims**



1. In a process for producing heat by means of a heat pump, comprising the steps of (a) circulating a vaporizable working fluid under superatmospheric pressure in counter-current heat exchange with an external fluid which acts as a heat source to progressively increase the temperature of the working fluid to cause progressive vaporization thereof, and simultaneously progressively cooling the external fluid, (b) compressing the vaporized working fluid, (c) circulating the compressed working fluid in counter-current heat exchange with a heating medium for simultaneously heating said medium and condensing the compressed working fluid, and (d) expanding the condensed working fluid and recycling it to step (a), the improvement wherein said process is conducted with a vaporizable working fluid which is a non-azeotrope forming mixture of at least two distinct constituents, including a major basic constituent and at least a second constituent making up 0.5 to 20% by molar concentration of the mixture, and wherein the critical temperature of the major basic constituent differs from that of the at least a second constituent by at least 20° C.

4,344,293

APPARATUS RESPONSIVE TO THE AMOUNT OF REFRIGERANT FLOW IN A REFRIGERANT FLOW IN A REFRIGERANT CIRCULATING SYSTEM

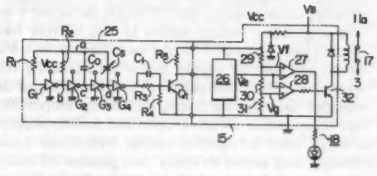
Toshitaka Fujiwara, Toyota; Teiichi Nabeta; Sigeyuki Akita, both of Okazaki, and Junji Kitagawa, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Feb. 23, 1981, Ser. No. 237,262

Claims priority, application Japan, Feb. 25, 1980, 55-23012

Int. Cl.³ F25B *49/00*; G01R *27/26*

U.S. Cl. 62—126 **5 Claims**



1. An apparatus responsive to the amount of flow of a refrigerant in a refrigerant circulating system, said apparatus comprising:

sensing capacitor means including a pair of electrodes and disposed in a portion of a refrigerant passage of said refrigerant circulating system;

a resistance-capacitance oscillator circuit including said sensing capacitor means as a displacement capacitor, said resistance-capacitance oscillator circuit forming a ring oscillator including a plurality of inverters, a plurality of resistors and first and second capacitors, said first capacitor forming said sensing capacitor means and said second capacitor having a predetermined capacitance value being biased in opposite directions to each other by input and output voltages of at least one of said inverters; and

output means responsive to oscillation frequencies of said resistance-capacitance oscillator circuit.

4,344,294

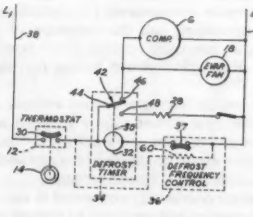
THERMAL DELAY DEMAND DEFROST SYSTEM

Robert B. Gelbard, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jul. 31, 1980, Ser. No. 174,054

Int. Cl.³ F25D *21/06*

U.S. Cl. 62—155 **8 Claims**



1. A defrost control system including a timing circuit for a refrigerator of the type having a cabinet containing feezer and fresh food storage compartments separated by a partition;

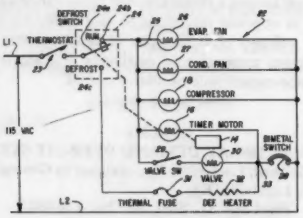
an inlet and outlet passageway in said partition;
an evaporator chamber associated with said freezer compartment including an evaporator;
air supply means circulating freezing compartment air over said evaporator and for directing a portion of said air through said fresh food compartment between said inlet and outlet passageways;
a refrigerator compressor;
a defrost heater;
a thermostatic switch responsive to the temperature in said fresh food compartment for energizing said compressor;
a defrost timing motor connected in series with said thermostatic switch;
a defrost switch means in series with said thermostatic switch being operable by said defrost timer after a normal period of timer operation from a first switch position to complete a circuit to said compressor to a second switch position to complete a circuit to said defrost heater;
a defrost frequency control means arranged in the path of air passing through said partition outlet for sensing the temperature of air passing therethrough, including a temperature responsive switch means in said defrost frequency control being operable when said thermostatic switch is closed and said air supply means is circulating relatively warm fresh food compartment air through said outlet to energize said defrost timer, and being inoperable when said thermostatic switch is open and said air supply means is inoperative to open as colder freezer air back flows through said outlet to delay energization of said defrost timer motor during initial operation of said fan means to alter said normal period of timer operation until said temperature responsive switch once again senses the relatively warm fresh food compartment air passing through said outlet.

4,344,295

CONTROL FOR TIMED OPERATION OF ICE MAKER

William J. Linstromberg, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 22, 1981, Ser. No. 227,264
Int. Cl.³ F25D *21/06*
U.S. Cl. 62—155 **19 Claims**



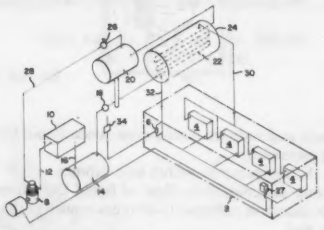
18. In a refrigeration apparatus having an ice making mechanism and common timing means for controlling the initiation of defrosting operations and the operation of said ice making mechanism, an improved control circuit comprising:
a source of electrical power having first and second terminals;
a defrost switch having a moving contact receiving power from said first power source terminal and movable between a run contact and a defrost contact;
refrigeration means connected between said run contact and said second power source terminal;
a timer motor operatively connected to said movable defrost switch contact and arranged to control the cyclic operation of said ice making mechanism, said timer motor having a first terminal connected to said run contact and having a second terminal;
a normally closed temperature responsive switch arranged to open at a temperature indicative of the completion of a defrosting operation and being connected between said second timer motor terminal and said second power source terminal; and,
a defrost heater connected between said defrost contact and said second timer motor terminal.

4,344,296

EFFICIENT SECOND STAGE COOLING SYSTEM

Jack W. Staples, 655 Keys Rd., Yakima, Wash. 98901, and James X. Norris, 507 Harris Ave., Selah, Wash. 98942

Continuation of Ser. No. 926,852, Jul. 21, 1978, abandoned. This application Sep. 15, 1980, Ser. No. 187,151
Int. Cl.³ F25B *7/00*; F25D *17/00*
U.S. Cl. 62—175 **7 Claims**



1. A two stage cooling system for use in conjunction with a closed food storage room, comprising:
a first or primary cooling stage located entirely outside the room to be cooled and including a compressor, condenser and evaporator, all functionally interconnected, said first stage containing a caustic but efficient refrigerant at a predetermined pressure,
temperature control means for the first stage, said control means located within the room such that the control of the primary circuit is responsive solely to the condition created by the secondary circuit,
a second cooling stage having its condenser and in thermal communication with the evaporator of the first stage within the heat exchanger, said second stage having at least one evaporator within the room and containing an inert refrigerant at a pressure higher than that of the primary stage whereby any leakage within the heat exchanger will result in a flow of refrigerant from the second to the first stage, thereby preventing any of the refrigerant from the first stage from entering the food storage room, enabling use of the caustic refrigerant in the first stage and any leakage within the room itself will not be harmful to the product.

4,344,297

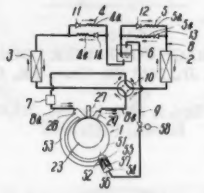
REFRIGERATION SYSTEM

Fumito Ueno, Shiga, and Kunio Fukuhara, Kusatsu, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Mar. 23, 1981, Ser. No. 246,857
Claims priority, application Japan, Mar. 20, 1980, 55-41044; Mar. 12, 1981, 56-36207
Int. Cl.³ F25B *41/00*
U.S. Cl. 62—196 C **3 Claims**

1. A refrigeration system comprising a rotary compressor for compressing a low pressure refrigerant gas to a high pressure; a refrigeration pipe line system having a fluid input and fluid output re.pectively connected with a discharge port and a suction port of said compressor and further having therein a pair of heat exchangers; a pair of expansion mechanisms; a gas-liquid separator provided at an intermediate position between said expansion mechanisms; and a gas injection passage channel extending from a gas zone at said gas-liquid separator

and connecting with an injection pressure port of said compressor; said compressor compris .g a rotor and a cylinder block which has a cylinder chamber housing therein said rotor, said suction port and said discharge port being open at said cylinder chamber, and said injection pressure port opening at a pumping chamber between said suction port and said discharge port, said cylinder block being provided with a valve chamber communicating with said injection pressure port and with a by-pass passage channel extending from said valve chamber to a suction port side of said chamber, said valve chamber having a control valve for opening and closing a passage channel



extending from said injection pressure port to said by-pass passage channel, a spring for biasing said control valve in the direction of being always open, and a back chamber at the rear side of said control valve, said control valve having a communicating aperture through which said back chamber communicates with said injection pressure port to permit the injection of an injection pressure gas from said injection pressure port to said pumping chamber, said gas injection passage channel communicating with said back chamber and having at an intermediate portion thereof an open-close valve which opens and closes said gas injection passage channel.

4,344,298

ICE CUBE FORMING TRAY FOR ICE MAKING MACHINE

John E. Biemiller, 1 Black Oak La., Westminster, Md. 21157

Filed Sep. 24, 1980, Ser. No. 190,204
Int. Cl.³ F25C *1/06*
U.S. Cl. 62—347 **20 Claims**

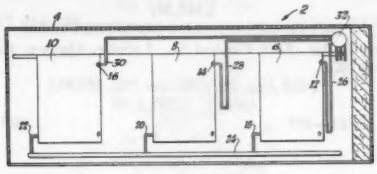
1. An ice cube forming tray for an ice making machine comprising a plurality of members each formed to provide a plurality of aligned openings with alternating openings facing in opposite directions, first plate means located between adjacent members to provide first side walls, second plate means located at opposite outer sides of said plurality of members to provide second side walls, and a plurality of refrigerant-receiving evaporator tubes passing through said first and second plate means and being located in and forming the bottoms of said openings to provide direct engagement with water in said openings.

4,344,299

TRANSPORTABLE COMPARTMENT REFRIGERATION PANEL SYSTEM AND METHOD OF INSTALLING

Latzer John B., 1010 E. Cypress Dr., Pompano Beach, Fla. 33060

Filed Aug. 5, 1980, Ser. No. 156,567
Int. Cl.³ F25D *19/02*
U.S. Cl. 62—448 **3 Claims**



1. A refrigeration system for conversion of a transportable shipping container into a transportable refrigeratable container including a compressor, an expansion valve which receives compressed coolant from said compressor through a compressor output conduit and distributes the coolant to one or more refrigeration panels through one or more refrigeration panel inlet conduits and a compressor input conduit connected to each said refrigeration panel outlet at a predetermined point along its surface, each said refrigeration panel comprising:

a protective liner means for protecting an internal refrigeration conduit and for connecting with said refrigeration conduit as a heat exchanger;

an internal refrigeration conduit connected to said protective liner for heat exchange;

a means for connecting said internal refrigeration conduit to said protective liner for bonding said refrigeration conduit to said protective liner and for increasing the heat exchange contact surface area between said refrigeration conduit and said protective liner;

an insulation layer means fitted between the surface of said protective liner and the interior surface of a container wall for encapsulating and insulating said refrigeration conduit;

a means for bonding said insulation layer to said protective liner for securing said protective liner, refrigeration conduit and insulation layer together into a unified self-contained panel;

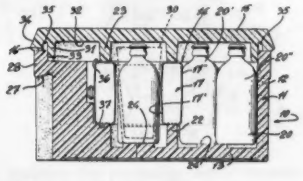
a means for attaching said refrigeration panel to an interior wall of said refrigeration compartment at a predetermined location.

4,344,300

CHILLERWELL COOLER

Frank Taylor, 9415 Central St., LaSalle, Quebec, Canada H8R 2K4

Filed Aug. 25, 1980, Ser. No. 180,852
Int. Cl.³ F25D *3/08*
U.S. Cl. 62—457 **12 Claims**



1. A cooler enclosure comprising a hollow base member having thermal insulating properties and defined by a continuous side wall, a bottom wall and an open top end; a lid engageable over said open top end and also having thermal insulating

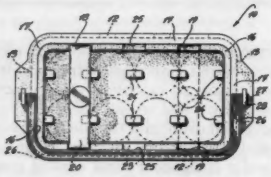
properties, a cooling container disposable in said base member for cooling air therein, said cooling container having a continuous outer and inner side wall, an inner cooling well intermediate said inner side wall for receiving one or more beverage containers therein, and one or more outer cooling compartments in said base member adjacent said outer wall of said cooling container.

4,344,301

BEVERAGE COOLER CONSTRUCTION

Frank Taylor, 9415 Central St., LaSalle, Quebec, Canada H8R 2K4

Filed Aug. 25, 1980, Ser. No. 180,853
Int. Cl.³ F25D *3/08*
U.S. Cl. 62—457 **10 Claims**



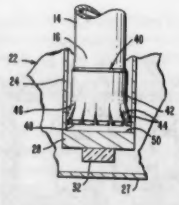
1. A portable beverage cooler comprising a hollow body having a bottom wall, opposed side walls and an open end; a lid for closing said open end, said hollow body and lid being formed of a material having thermal insulating properties, engagement means in opposed ones of a pair of said side walls for vertically supporting a coolant container spaced adjacent a respective one of said other two opposed side walls of said body and in an upper portion of said body above said bottom wall whereby a plurality of beverage containers may be placed in a lower level portion of said body with said coolant containers held thereabove and defining between them an upper level portion for containment of further beverage containers resting on said containers in said lower level portion, such disposition of said beverage containers providing for convection of cooled air by said coolant containers to all said beverage containers to maintain them at substantially the same temperature during a given period of time.

4,344,302

THERMAL COUPLING STRUCTURE FOR CRYOGENIC REFRIGERATION

Harold M. Jarrett, Jr., Los Angeles, and Thomas P. Cotter, Cypress, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Jun. 8, 1981, Ser. No. 271,746
Int. Cl.³ F25D *19/00*
U.S. Cl. 62—514 R **11 Claims**



1. A thermal coupling structure for thermal interconnection between a cryogenic cold finger having a side wall and the inner wall of a dewar surrounding the cold finger, said thermal coupling structure comprising:

a collar thermally engaged around said cold finger on the side wall thereof for mechanical support thereby and for thermal connection therewith, said collar being engaged on said spring finger by structure selected from the group consisting of adhesive, solder and interference fit;

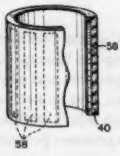
a plurality of spring fingers mounted on said collar and in thermal connection therewith, said spring fingers extending outward from said collar to resiliently engage upon the inner wall of the dewar and away from the end wall of the dewar surrounding the cold finger so that heat is transferred from the inner wall of the dewar through said spring fingers and through said collar to the side wall of said cold finger.

4,344,303

BEVERAGE CONTAINER COOLER

C. Brantley Kelly, Jr., 2615 Elk Grove Rd., Carrollton, Tex. 75006

Filed Dec. 1, 1980, Ser. No. 212,074
Int. Cl.³ F25D *3/08*
U.S. Cl. 62—530 **8 Claims**



1. A flexible cooling device capable of conforming to irregular shaped surfaces comprising:

an elastic insulating layer having a cooling surface;

a plurality of discrete sealed cavities spaced from each other with sufficient portions of the elastic layer between the spaced cavities to provide sufficient flexibility to allow the cooling surface to conform to irregular shaped surfaces and imbedded in the insulating layer adjacent the cooling surface; and

a cooling fluid for freezing within the cavities.

4,344,304

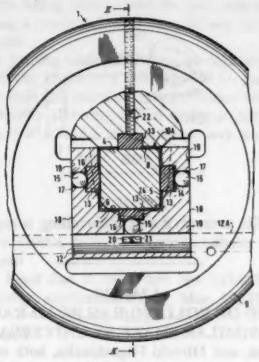
COUPLING FOR MANDRELS OR THE LIKE

Hans Eiche, Lörrach, Fed. Rep. of Germany, assignor to Kunz Maschinen- u. Apparatebau GmbH, Lorrach-Hauingen, Fed. Rep. of Germany

Filed Nov. 28, 1979, Ser. No. 97,963
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1978, 2852510
Int. Cl.³ F16D *3/58*
U.S. Cl. 464—85 **48 Claims**

1. A coupling for separably connecting a mandrel having a multi-facetted end portion of polygonal cross-sectional outline with a rotary torque-transmitting component, comprising a socket rotatable with the torque-transmitting component, said socket having a cavity for receiving the end portion of the mandrel with at least some clearance, and said socket further having internal surfaces which bound said cavity and are complementary to the facets of the end portion of the mandrel, said socket also having a portion which is movable between an operative and an inoperative position in which the end portion of the mandrel is respectively confined in and removable from said cavity; means for compensating for the clearance of the end portion of the mandrel in said cavity, said compensating means including at least one cushioning element disposed between one of said internal surfaces and the corresponding facet of the end portion of the mandrel in said cavity, and at least a portion of said cushioning element being movable between an extended position in which said cushioning element

extends beyond the respective internal surface of said socket and a retracted position; and means for maintaining said cushioning element in said extended position when said movable portion of said socket is in said operative position.



4,344,305
TORQUE SHAFT COUPLING

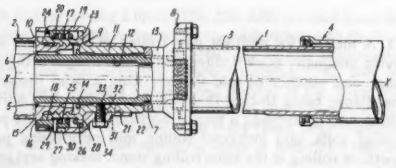
Frederick H. Holmes, Blackpool, England, assignor to British Aerospace, Weybridge, England

Filed Mar. 14, 1980, Ser. No. 130,338

Claims priority, application United Kingdom, Mar. 22, 1979, 7910091

Int. Cl.³ F16D 3/06

U.S. Cl. 464—169 **8 Claims**



1. Coupling means for two coaxial torque transmitting shafts including:

torque transmitting joint means capable of sliding axial movement into and out of a torque transmitting condition, relatively rotatable means for effecting said sliding axial movement of said joint means upon relative rotation of said rotatable means,

means for preventing said rotational movement, said preventing means being axially movable into and out of a locking condition wherein, when in said locking condition, rotatable movement of said relatively rotatable means is prevented,

detent means for preventing inadvertent axial movement of said relatively rotatable means from the said locked condition,

said coupling means further including a housing member capable of both rotational and axial movement, said housing member being operatively associated with said detent means such that limited rotational movement of said housing member places said detent means into a condition in which axial movement of said housing member is allowed or prevented, with said means for preventing said rotational movement so that axial movement of said housing member axially moves said means for preventing said rotational movement into or out of said locking condition, and with said relatively rotatable means for effecting said sliding axial movement such that, when said means for preventing said rotational movement is out of the locking condition, rotation of said housing member effects the drawing of said joint means into or out of the torque transmitting condition.

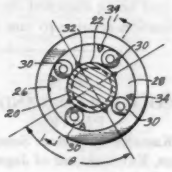
4,344,306
OVERLOAD CLUTCH

Manning Citron, 1895 Warwick Rd., San Marino, Calif. 91108

Filed Jun. 30, 1980, Ser. No. 164,690

Int. Cl.³ F16D 7/02

U.S. Cl. 464—34 **5 Claims**



1. An overload clutch or the like, comprising:

a rotatable drive member, a rotating driven member coaxial with the drive member, said members forming an annular chamber having concentric inner and outer cylindrical surfaces which are rotated respectively by the drive and driven members about their common axis, and a plurality of cylindrical rollers of elastomeric material in said annular chamber between said inner and outer cylindrical surfaces, both members including angularly spaced radial teeth projecting into the annular chamber from said cylindrical surfaces a distance less than half the radial distance between said surfaces, each of the rollers being positioned between a pair of teeth projecting into the annular chamber respectively from the two members, the arcuate spacing between adjacent teeth projecting from one of said members being slightly different from the arcuate spacing of the opposing teeth projecting from the other member, whereby the rollers positioned between adjacent pairs of teeth are in a different state of compression when transmitting torque.

4,344,307
THREAD CONTROL MEANS IN A TEXTILE MACHINE

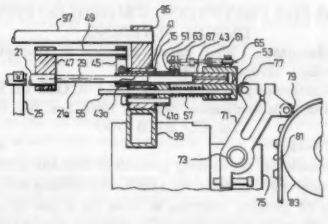
Robert R. Bucher, and Felix Riner, both of Frick, Switzerland, assignors to Textilma AG, Switzerland

Filed Jul. 11, 1980, Ser. No. 168,662

Claims priority, application Switzerland, Jul. 12, 1979, 6497/79

Int. Cl.³ D04B 23/06

U.S. Cl. 66—84 R **18 Claims**



1. In a machine for producing textile material, a thread control means comprising thread guide device mounted for pivotation about a pivot axis, a crank operatively connected to said thread guide means to be pivotable therewith about said pivot axis but restrained against movement parallel to said axis,

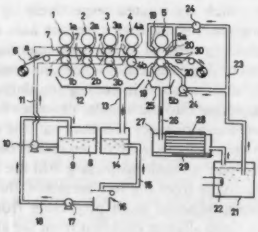
drive transmission means mounted for reciprocating motion in a plane parallel to said pivot axis, and connecting means so connecting said drive transmission means to said crank as to convert said reciprocating motion of said drive transmission means into oscillatory pivotation of said crank and thereby of said thread guide means about said pivot axis, said connecting means comprising a link element, a first pivot joint connecting said link element to said crank and a second pivot joint connecting said link element to said drive transmission means, said pivot joints being arranged to permit pivotation of said link element relative to said crank and drive transmission means in three dimensions and being disposed on a straight line which extends at an inclination relative to said axis.

4,344,308

METHOD FOR COLD ROLLING AND CLEANING STEEL PLATES

Shoji Shimada, Kamakura; Sakae Sonoda, Yokohama, and Kimio Yokoyama, Kawasaki, all of Japan, assignors to Nihon Parkerizing Co., Ltd., Japan

Filed Jul. 23, 1980, Ser. No. 171,397
Claims priority, application Japan, Jul. 25, 1979, 54-94556
Int. Cl.³ B21B *45/02, 45/06*
U.S. Cl. 72—39 **7 Claims**



1. In a method of cold rolling and cleaning metal strip characterized in that a pressurized cleaning solution is sprayed on both opposite planar surfaces of a metal strip immediately before and after at least a final rolling step, wherein the improvement comprises maintaining the relationship between the temperature and the pressure of said cleaning solution in accordance with the inequality;

$$(T)^3 \times P > 3.5 \times 10^5,$$

wherein T is the temperature of said cleaning solution in °C., and P is the pressure of said cleaning solution in kg/cm².

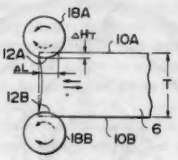
4,344,309

PROCESS FOR PREVENTING GROWTH OF FISHTAILS DURING SLABBING

Minoru Matsuzaki, Chiba, Japan, assignor to Kawasaki Steel Corporation, Hyogo, Japan

Continuation-in-part of Ser. No. 953,170, Oct. 20, 1978, abandoned. This application Sep. 12, 1980, Ser. No. 186,750
Int. Cl.³ B21B *1/00*
U.S. Cl. 72—199 **4 Claims**

1. A process for preventing growth of fishtails during slabbing of a steel ingot effected by a reversible rolling mill, including a step of forming recesses at least on a pair of opposite surfaces at least at either the top or bottom of said steel ingot by use of rolling rolls, wherein said process further includes a method of forming recesses in the thicknesswise and widthwise directions, and the ratio between the widthwise reduction value and the thicknesswise reduction value for forming said recesses is regulated to 0.40~0.65 in a region where the side profile of the material due to the thicknesswise reduction presents a double barrelling and the value in a region where



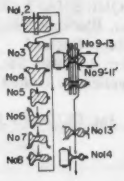
said side profile presents a single barrelling is regulated to 0.3 or less.

4,344,310

METHOD OF ROLLING RAILROAD-RAILS AND STEELS OF SIMILAR SHAPE BY UNIVERSAL ROLLING

Haruo Kozono, and Hiroshi Higashinaka, both of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jul. 25, 1980, Ser. No. 172,443
Claims priority, application Japan, Aug. 3, 1979, 54/98663
Int. Cl.³ B21B *13/10*
U.S. Cl. 72—225 **2 Claims**



1. A method for multiple pass rolling of blanks into shapes having unequally thick flanges, one of said flanges being a base flange and another of said flanges being a head flange, said head flange being thicker than said base flange, in a universal rolling mill comprising a pair of horizontal rolls and a pair of vertical rolls, said universal rolling mill performing precise repetitive rolling in the same rolling stand, making said universal rolling possible with less number of stands having a conventional screw down mechanism, compensating vertical roll-set-up inaccuracy because of the horizontal roll axial displacement during rolling due to the imbalance of vertical-roll forces, even under the rolling condition of uniform longitudinal elongation generally meant for minimizing bending of a blank, said imbalance of vertical roll forces caused by the unequal contact area of the flange width and unequal deformation resistance resulting from the non-uniform temperature of the unequal flange thickness; said method comprising the steps of:

determining axial displacement of said horizontal rolls and radial displacement of vertical rolls based upon a reduction schedule when said blank passes through a specific roll pass surrounded by said horizontal and vertical rolls;

analyzing the displacements in terms of roll force so as to determine the non-linear relationship between the axial displacement of horizontal rolls and the roll-force difference acting on each of the two vertical rolls;

setting the base flange roll gap for each pass to correspond to the base flange outgoing thickness minus the base flange vertical roll mill spring minus the corresponding axial displacement of the horizontal rolls; and

setting the head flange roll gap for each pass to correspond to the head flange outgoing thickness minus the head flange vertical roll mill spring plus the corresponding axial displacement of the horizontal rolls, said base and head flange vertical roll mill springs being determined in accordance with the base and head vertical roll force, respec-

tively, divided by the base and head vertical roll mill modulus, respectively, and said corresponding axial displacement being determined by said non-linear relationship using a predicted difference of said two vertical roll forces; and

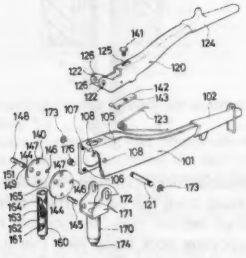
repeatedly passing said blank through said universal rolling mill with the successive roll gaps set for each pass of the multiple-pass roll schedule in accordance with said setting steps, thereby allowing actual multiple precise rolling of the universal rolling mill without any augmenting roll stand.

4,344,311

RIVETER

Tadashi Inoue, Osaka, Japan, assignor to Lobster Tool Co., Ltd., Osaka, Japan

Filed Jan. 7, 1981, Ser. No. 223,079
Claims priority, application Japan, Mar. 19, 1980, 55-36032
Int. Cl.³ B21J *15/34*
U.S. Cl. 72—391 **3 Claims**



1. A riveter having a lever (**120, 220, 320**) pivoted to a frame main body (**101**) and reciprocally turnable relative to the frame to reciprocate a jaw case (**160, 460**), the riveter comprising a turnable jaw case actuating support member (**140, 240, 340, 440**) disposed within a forward end portion of the frame main body (**101**) and mounted on a pivot for supporting the lever (**120, 220, 320**) on the frame main body (**101**), coupling means capable of locking the actuating support member (**140, 240, 340, 440**)

in a plurality of positions relative to the lever (**120, 220, 320**) and displaced from each other through a predetermined angle (θ), the jaw case (**160, 460**) being turnably supported by the actuating support member (**140, 240, 340, 440**) eccentrically of the pivot and reciprocally movable straight by reciprocal turn of the lever (**120, 220, 320**) through reciprocal turn of the actuating support member (**140, 240, 340, 440**) connected thereto, and a jaw case tubular housing (**170**) turnably supported by the forward end portion of the frame main body (**101**) and lockable in a plurality of positions angularly spaced from each other by the same angle as the angle of displacement (θ).

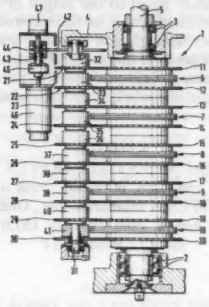
4,344,312

FORMING PRESS WITH A CAM ARRANGEMENT

Walter Flamme, Wegberg-Beeckerheide, and Oskar Rahn, Kempen, both of Fed. Rep. of Germany, assignors to Peltzer & Ehlers GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed Jan. 28, 1980, Ser. No. 116,211
Int. Cl.³ B21J *9/10*
U.S. Cl. 72—452 **7 Claims**

1. A multistage forming press having means for selectively controlling the operation of a plurality of work handling elements associated with said press, said controlling means comprising a camshaft having at least one releasable cam disc member mounted thereon for actuating a cam follower associated with said cam disc member and connected to at least one of said work handling elements, means for drivingly coupling said cam disc member and said camshaft in response to a supplied pressure medium under pressure, and adjusting motor means couplable to said cam disc member for rotating said cam



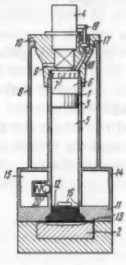
disc member relative to said camshaft for varying the duration and timing of said cam disc member and thereby controlling said work handling elements.

4,344,313

HYDROPUNCH FOR USE IN A PRESS

Viktor N. Chachin, ulitsa Kulmana, 15, kv. 91; Vladimir K. Kolos, ulitsa Kulmana, 26, kv. 50; Viktor V. Botyan, ulitsa Lenina, 11/35, kv. 11; Vladimir I. Luzgin, ulitsa Plekhanova, 63, kv. 52, and Igor K. Antonenkov, Izmailovsky pereulok, 47, kv. 2, all of Minsk, U.S.S.R.

Filed Jan. 3, 1980, Ser. No. 109,296
Int. Cl.³ B21J *7/38*
U.S. Cl. 72—453.1 **3 Claims**



1. A hydropunch for use in a press including a die having a working surface for receiving a piece to be worked, comprising: a cylinder having a wall body with two ends, a first end facing the working surface of the die, and a second end facing in the opposite direction from said first end; a ram accommodated within said cylinder for movement therealong so as to form therein an above the-ram chamber and a below-the-ram chamber; means for actuating said ram, said means being arranged on the second end of said cylinder; a compressed gas receiver selectively communicable with the above-the-ram chamber of said cylinder, said means for actuating controlling fluid communication between said compressed gas receiver and said above-the-ram chamber in such manner that said ram is moved from an original raised position towards the first end of said cylinder when fluid communication is established; a cover for closing both said cylinder and receiver; and means for returning the ram to said original position, said means including a closed chamber communicating with the below-the-ram chamber of said cylinder, a valve adapted to communicate the above-the-ram chamber of said cylinder with the

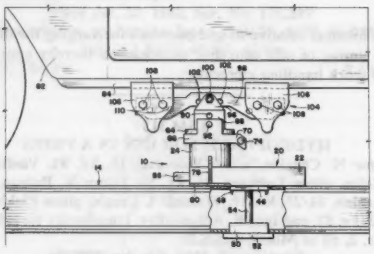
atmosphere, said valve being built in an opening provided in said cover, and a non-return valve for admitting used gas into said closed chamber, said non-return valve being built in a wall of said cylinder at a distance, from the one end thereof facing the die, approximately equal to the height of the ram so that said above-the-ram chamber is in fluid communication with said closed chamber through said non-return valve when said ram is in the lowest position thereof, and a high pressure chamber containing an elastic fluid positioned at the end of cylinder between the ram and the working surface of the die.

4,344,314

ALIGNMENT APPARATUS

Roger B. Aldrich, and Gary R. White, both of Grand Island, Nebr., assignors to Chief Industries, Inc., Grand Island, Nebr.

Filed Jun. 6, 1980, Ser. No. 157,015
Int. Cl.³ B21D *1/14*
U.S. Cl. 72—461 **26 Claims**



1. In a treadway upon which a vehicle, whose structure is to be realigned, is positioned, said treadway including a plurality of spaced openings arranged in a predetermined array, the improvement in means to interconnect the treadway and a selected portion of the vehicle structure comprising:

a base assembly having an elongated horizontal leg and a vertical member, said horizontal leg including an upper and lower portions spaced to define a horizontal opening therebetween, said lower portion of said elongated horizontal leg adapted to rest on the treadway;

a hold down bar receivable within said horizontal opening;

means positionable within the spaced openings of the treadway to interconnect said hold down bar to the treadway; and

attachment means secured to said vertical member for attachment to the selected portion of the vehicle structure;

whereby said means to interconnect may be securely fastened to said treadway to prevent movement relative thereto of said base assembly and said hold down bar or fastened to said treadway to prevent movement relative thereto of said base assembly and said hold down bar or fastened to said treadway to allow movement of said base assembly with that selected portion of the vehicle structure being realigned.

4,344,315

METHOD AND DEVICE FOR DISTINGUISHING MATERIAL BY THERMAL CONDUCTIVITY

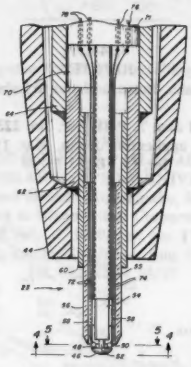
Edwin C. Moxon, Boxboro, and Wilson P. Menashi, Lexington, both of Mass., assignors to Ceres Electronics Corporation, Waltham, Mass.

Continuation of Ser. No. 974,649, Dec. 29, 1978, abandoned.
This application Dec. 5, 1980, Ser. No. 213,560
Int. Cl.³ G01N *25/18, 27/18*
U.S. Cl. 374—44 **30 Claims**

1. A thermal conductivity testing probe including means for subjecting a sample to heat flow relative to the probe, the probe comprising:

a sample contacting head of high thermal conductivity of at least about two watts per centimeter per degree Kelvin and of low thermal mass, the thermal conductivity and thermal mass of the head being such that the head time constant for temperature change is in the order of one second, the sample contacting head having a rounded end surface;

heat flow and temperature sensing means mounted to and in thermal contact with a back surface of the sample contacting head opposite to the rounded end surface; and



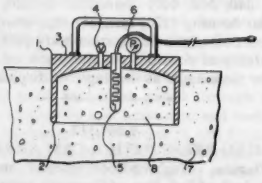
a head supporting neck extending between the sample contacting head, from the back surface thereof, and a relatively large thermal mass, the thermal resistance of the head supporting neck being such that it allows for heat flow from the head to the relatively large thermal mass which is substantially greater than the heat flow from the head to the surrounding environment, but that heat flow to the large thermal mass being substantially less than that of a contacted diamond sample.

4,344,316

METHOD AND APPARATUS FOR INDICATING THE AIR CONTENT OF CONCRETE IN SITU

Karim W. Nasser, Saskatoon, Canada, assignor to Canadian Patents & Development Ltd., Ottawa, Canada

Filed Sep. 29, 1980, Ser. No. 191,832
Claims priority, application Canada, Oct. 30, 1979, 338752
Int. Cl.³ G01N *7/16*
U.S. Cl. 73—19 **4 Claims**



1. A method for indicating the air content of fresh concrete in situ, comprising;

providing a chamber having an open end and an opposite closeable end, said chamber provided with heating means and pressure measuring means;

inserting the open end of the chamber into the concrete, with opposite end opened;

closing said opposite end and heating the contents of the chamber with a predetermined energy input at a temperature less than the boiling point, and

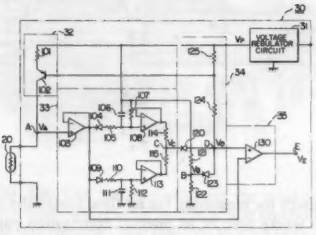
determining the pressure increase in the chamber, wherein the pressure increase is a function of the air content.

4,344,317

AIR-FUEL RATIO DETECTING SYSTEM

Tadashi Hattori, Okazaki, and Yoshiki Ueno, Aichi, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Aug. 1, 1980, Ser. No. 174,446
Claims priority, application Japan, Sep. 14, 1979, 54-118154
Int. Cl.³ G01N 27/12
U.S. Cl. 73—23 7 Claims



1. An air-fuel ratio detecting system for internal combustion engines comprising:

an air-fuel sensor for sensing the composition of exhaust gases from an engine to determine the ratio of air to fuel, said sensor having an electric resistance value varying in accordance with said air-fuel ratio;

a current control circuit for controlling the operating current of said air-fuel ratio sensor;

means for producing an average voltage of a varying voltage at a junction point of said air-fuel ratio sensor and said current control circuit;

a bias control circuit responsive to the value of said average voltage to adjust a current control amount of said current control circuit; and

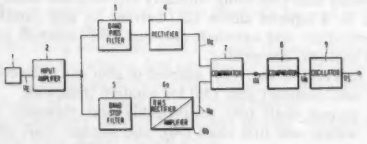
a comparison circuit for producing an air-fuel ratio detection signal in accordance with the voltage at said junction point and the value of said average voltage, wherein said average voltage generating means includes means for detecting a rich peak value means for detecting a lean peak voltage, and means for generating a voltage intermediate between said peak voltages.

4,344,318

UNDESIRABLE COMBUSTION CHARACTERISTIC DETECTOR FOR SPARK-IGNITED INTERNAL COMBUSTION ENGINES

Ingo Düdeck, Weinstadt, and Manfred Maass, Esslingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 5, 1980, Ser. No. 213,404
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1979, 2948856
Int. Cl.³ G01L 23/22
U.S. Cl. 73—35 7 Claims



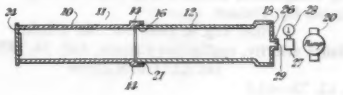
1. An apparatus for detecting of unesirable combustion characteristics in a spark-ignited internal combustion engine, the apparatus including a sensor means for sensing a solid-borne sound signal and for providing an output signal thereof, and a band-pass filter means tuned to an engine knock vibration frequency, the output signal of the sensor means being fed to the by-pass filter means, a rectifier means for rectifying a signal received from the band-pass filter means to an engine knock signal, means for converting the output signal from the sensor means into an engine knock reference signal, and a comparator means for comparing the engine knock signal with the engine knock reference signal and for providing an output signal if the knock signal exceeds the knock reference signal, characterized in that comparing means are provided for receiving the output signal from the comparator means and for providing an output signal of a predetermined time duration if a time duration of the output signal of the comparator means is longer than a specific preset time duration of the comparing means.

4,344,319

PIPE JOINT SEALED TEST METHOD

Dane R. Hancock, 516 Bontona Ave., Fort Lauderdale, Fla. 33301, and Burgess F. Rand, 2621 SW. 15th Ct., Fort Lauderdale, Fla. 33315

Filed Mar. 7, 1980, Ser. No. 128,278
Int. Cl.³ G01M 3/28
U.S. Cl. 73—40.5 R 2 Claims



1. A method of quickly testing the sealing integrity of pipes layed in a pipe string underwater by utilizing a pump in a bulkhead to connect one to the other comprising the steps of:

connecting a pump and bulkhead to the open end of the pipe string;

pumping liquid from within said pipe string creating a pressure differential between the pressure within said pipe string and the pressure outside of said pipes,

measuring the flow from within said pipes through said pump for a reasonable period of time,

detecting zero displacement of liquid from said pump by monitoring said flow to determine a zero flow rate through said pump to test for good sealing integrity.

4,344,320

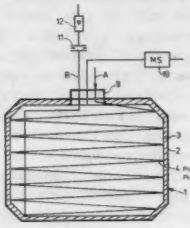
CRACK INDICATOR FOR MONITORING THE INSULATION OF LIQUEFIED GAS TANKS

Walter Haupt, Leverkusen; Heinz Warncke, Cologne; Heinz W. Friebe, Ludwigshafen, and Dieter Reimold, Heddesheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen and Rheinhold & Mahla GmbH, Mannheim, both of, Fed. Rep. of Germany

Filed Apr. 14, 1980, Ser. No. 139,953
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1979, 2917255
Int. Cl.³ G01M 3/22, 3/26
U.S. Cl. 73—40.7 13 Claims

1. In an apparatus for indicating a crack in the internal insulation of a gas container for low boiling, liquefied gases having a piping system within the insulation, the improvement wherein: the piping system consists of cold-embrittled plastic pipes which are embedded in and rigidly connected to the insulating material; means for applying a gas into the piping system which is under an excess pressure greater than the maximum pressure of the liquefied gas at the bottom of the

container with maximum filling; and indicator means for producing an electrical alarm signal in response to the excess



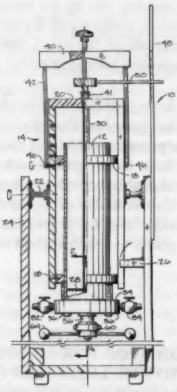
pressure gas flowing out into the tank interior in the event of a crack in the piping system.

4,344,321

SLURRY MEASURING APPARATUS

Pertti Haapamäki, Beaconsfield, Canada, assignor to Rauma-Repola Oy, Finland

Filed Aug. 4, 1980, Ser. No. 175,007
Claims priority, application Canada, Aug. 24, 1979, 334392
Int. Cl.³ G01N *15/04*
U.S. Cl. 73—61.4 **3 Claims**



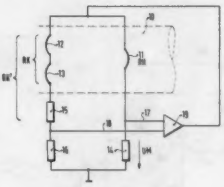
1. Apparatus comprising a cylinder suitably adapted to be tilted from a vertical to a horizontal position and beyond; a piston slidably positioned in the cylinder; said piston having a porous face to retain solids but to provide communication for liquid between the face of the piston and the rear thereof; a porous member positioned to cover one end of the cylinder; a chamber secured to the cylinder outwardly of said porous member; and the end wall of the cylinder outwardly of the porous member being mounted in said chamber with its surface being in juxtaposition to the surface of said porous member and adapted for linear movement within the chamber toward and away from fully closed or fully opened positions relative to said porous member; and means for selectively positioning the end wall of said cylinder relative to the porous member; and valve means in the chamber for drainage thereof or admission of liquids therein.

4,344,322

DEVICE FOR AIR FLOW RATE MEASUREMENT IN THE AIR INTAKE TUBE OF AN INTERNAL COMBUSTION ENGINE

Günther Plapp, Filderstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 6, 1980, Ser. No. 156,956
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1979, 2929427
Int. Cl.³ G01F *1/68*
U.S. Cl. 73—118 **4 Claims**



1. A device for measuring the air flow rate of the air flowing in the air intake tube of an internal combustion engine, comprising a bridge circuit having:

at least two hot wire resistors located in different branches of the bridge circuit, and identically positioned but spatially separated in the air intake tube; and

means for providing closed-loop electric current control and maintaining the temperature difference between the resistors constant, wherein;

(i) The temperature of each hot wire is maintained above the temperature of the air flow; and

(ii) The temperature coefficients of the branches containing the hot wires have the following relationship:

$$\alpha KO' = \frac{\alpha HO}{1+\alpha HO(T\ddot{u}1 - T\ddot{u}2)}$$

where

αKO′ is the temperature coefficient of one of said branches of the bridge circuit;

αHO is the temperature coefficient of the other of said branches of the bridge circuit;

Tü1 is the excess temperature of a hot wire in said one bridge branch over the air flow temperature; and

Tü2 is the excess temperature of at least one hot wire in said other bridge branch over the air flow temperature.

4,344,323

DYNAMIC TIMING ADJUSTMENT TOOL

Ronald D. Richardson, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 19, 1980, Ser. No. 122,230
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—119 A **5 Claims**

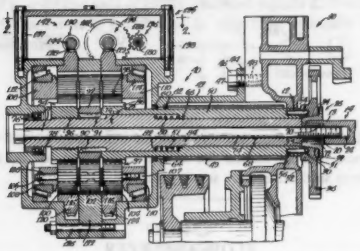
1. A tool (**40**) for adjusting the relative angular positions of a camshaft (**14**) and a mainshaft, said camshaft (**14**) having a radial gear (**36**) engaging and driven by said mainshaft, said camshaft gear (**36**) being rotatably received and axially adjustable on a tapered sleeve (**26**) carried on said camshaft (**14**) intermediate said camshaft (**14**) and said camshaft gear (**36**), said tool (**40**) comprising:

a first hollow shaft (**50**) adapted to abut and to be coupled to said camshaft gear (**36**) for rotation therewith;

a second shaft (**66**) reciprocably and rotatably received within said first shaft (**50**), said second shaft (**66**) being adapted to abut said tapered sleeve (**26**) and to be coupled to said camshaft (**14**) for rotation therewith, said first and second shafts (**50,66**) having means (**92–94, 97–104**) coupling said second shaft (**66**) to said first shaft (**50**) for rotatable driving of said second shaft (**66**) at the same rate

of rotation as said first shaft (**50**) in response to said rotation of said first shaft (**50**);

means (**90, 92, 102, 104, 124, 134**) for intermittently adjusting the rate of rotation of said second shaft (**66**) relative to that of said first shaft (**50**) to adjust the relative angular positions of said first and second shafts (**50, 66**); and



means (**94, 100, 120, 130**) for adjusting the axial position of said first shaft (**50**) relative to that of said second shaft (**66**) to urge said camshaft gear (**36**) into locking engagement of said tapered sleeve (**26**).

4,344,324

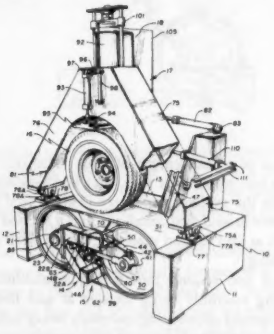
FLAT BELT TIRE TESTER

William J. Langer, Eden Prairie, Minn., assignor to MTS Systems Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 14,436, Feb. 23, 1979, Pat. No. 4,238,954. This application Dec. 11, 1980, Ser. No. 215,428

Int. Cl.³ G01M *17/02;* **B65G** *15/64*

U.S. Cl. 73—146 **10 Claims**



1. A machine having a pair of drums for mounting a road simulation belt thereon for movement as said drums are driven, comprising a frame member for supporting said drums with the surfaces of the drums closely spaced from each other;

means to rotatably mount a first of said drums on said frame member,

means to rotatably mount a second of said drums relative to said frame member about an axis generally parallel to the axis of the first drum;

said drums being positioned with the sides thereof generally aligned, and there being first and second planes tangent to the drums extending between said drums, and along which planes any belt mounted on said drum moves;

said frame member including first and second portions on opposite sides of said second drum;

said means to rotatably mount said second drum including;

a link universally pivotally connected to said first portion of the frame and connected to support said second drum adjacent one side thereof,

a lever arm pivotally mounted to the second frame portion about a lever axis generally perpendicular to the axis of rotation of said second drum,

means coupling said lever arm to the second drum on the opposite side of the drum from the link to permit the second drum to rotate relative to said lever arm, and

support link means mounted relative to the frame to guide movement of said second drum to cause said second drum to tilt about a tilt axis lying along one of said planes and generally perpendicular to the axis of rotation of said second drum when said lever arm is moved about its lever axis.

4,344,325

MECHANISM FOR SETTING SLIP AND/OR CAMBER ANGLES IN TIRE TESTING MACHINE

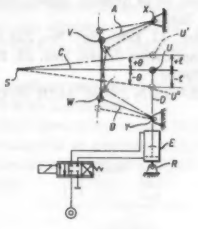
Atsuaki Iwama, Kobe, Japan, assignor to Kobe Steel, Ltd., Kobe, Japan

Filed Apr. 29, 1980, Ser. No. 144,885

Claims priority, application Japan, May 4, 1979, 54-055117

Int. Cl.³ G01M *17/02*

U.S. Cl. 73—146 **3 Claims**



1. A mechanism for setting slip and/or camber angles in a tire testing machine having a movable frame and a rotating wheel serving a substitutional road, the angle setting mechanism comprising:

a support shaft adapted to support a tire rotatably at the center thereof for contact with the rotating wheel;

a swingable linkage provided between said tire support shaft and the movable frame of said tire testing machine and comprising four trapezoidally connected link levers including a pair of outwardly converging side link levers, an outer link lever having opposite ends thereof pivotably connected to outer converging ends of said side link levers and centrally fixed to an inner end portion of said tire support shaft, and an inner link lever having opposite ends thereof pivotably connected to inner end portions of said side link levers and securely supported on said movable frame of said testing machine; and

means for swinging said outer link lever back and forth for tilting said tire support shaft with respect to the surface of said movable frame.

4,344,326

NON-DESTRUCTIVE TESTING OF A LAMINATED CERAMIC CAPACITOR

Sherwin R. Kahn, South Brunswick Township, Middlesex County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jul. 23, 1980, Ser. No. 171,585

Int. Cl.³ G01N *29/04*

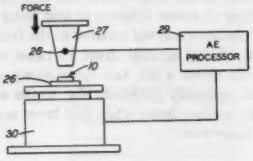
U.S. Cl. 73—587 **11 Claims**

1. A method of testing a substantially planar capacitor having alternate laminations of metal and ceramic material, comprising the steps of:

placing the capacitor on a planar base;

applying a load to the laminated capacitor in a direction perpendicular to the laminations;

monitoring acoustic emission signals emanating from the capacitor during the application of the load; and



comparing the acoustic emission signals to previously developed acousic emission signals from physically acceptable capacitors to determine the acceptability of the capacitor.

4,344,327

ELECTRONIC SCANNING ULTRASONIC DIAGNOSTIC SYSTEM

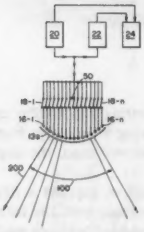
Yoshihiro Yoshikawa; Takao Katabami; Katsumi Fujinaga, and Yoshiaki Kobayashi, all of Mitaka, Japan, assignors to Aloka Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1980, Ser. No. 219,578

Claims priority, application Japan, Dec. 28, 1979, 54-170408; Dec. 28, 1979, 54-170409

Int. Cl.³ G01N *29/04;* A61B *10/00*

U.S. Cl. 73—626 **3 Claims**



1. An electronic scanning ultrasonic diagnostic system comprising:

a probe havng ultrasonic beam emitting surface which is pressed to contact the surface of a body to be examined and in which plural ultrasonic wave transducers are convexly arranged at equal distances, said probe emitting desired sector scanning ultrasonic beams into the body without intermediate medium material; and

means for energizing to drive selected ultrasonic wave trasducers out of said plural ultrasonic wave transducers according to the predetermined program at every timing of transmitting and receiving waves.

4,344,328

FREQUENCY DETECTOR

Royal R. Hawkins, Bloomington, Minn., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 14, 1979, Ser. No. 94,137

Int. Cl.³ G01H *13/00*

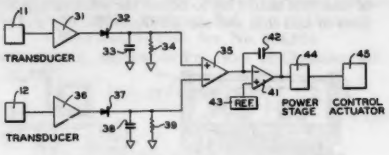
U.S. Cl. 73—651 **19 Claims**

1. A frequency detector for detecting the frequency of vibration of an apparatus comprising:

first vibration sensing means for providing a first output having a first frequency response to said frequency of vibration;

second vibration sensing means for providing a second output having a second frequency response to said frequency of vibration;

difference sensing means connected to said first and second vibration sensing means for providing a third output dependent upon the difference between said first and second outputs; and,



load means having a reset amplifier connected to said difference sensing means for being responsive to the output from said difference sensing means.

4,344,329

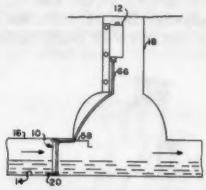
FLOW ANALYZER

Peter D. Petroff, Penthouse No. 2, Marbella Del Caribe, Este, Isla Verde, P.R. 00913

Division of Ser. No. 104,540, Dec. 17, 1979, Pat. No. 4,295,197, which is a division of Ser. No. 905,196, May 12, 1978, Pat. No. 4,211,111, which is a division of Ser. No. 811,557, Jun. 30, 1977, Pat. No. 4,116,061, which is a division of Ser. No. 602,974, Aug. 8, 1975, Pat. No. 4,070,563. This application May 18, 1981, Ser. No. 264,644

Int. Cl.³ G01F *1/52*

U.S. Cl. 73—861 **8 Claims**



1. A system of measurement of flow rates occurring in a sewer system having at least two, first and second, manholes located within the system, and there being a first sewer pipe with an exit end at said first manhole, and a second sewer pipe having an exit at said second manhole, said system of measurement comprising:

at least first and second monitoring assemblies, said first monitoring assembly being located at said first manhole, and said second monitoring assembly being located at said second manhole, and wherein each monitoring assembly comprises:

liquid height sensing means comprising a pressure-to-electrical signal transducer for sensing liquid height in a pipe and providing as an output a signal which is a function of such liquid height,

mounting means for positioning said transducer in a said exit end region in a said sewer pipe and adjacent the bottom of that sewer pipe,

timing means, synchronized with timing means in each other said monitoring assemblies, for providing time signals,

analog-to-digital conversion means responsive to timing signals from said timing means and signals from said liquid height sensing means for periodically, at a selected rate, converting said height signals into digitally encoded, time identified, liquid height representative signals, and

memory means responsive to said analog-to-digital conversion means for storing discrete time identifiable said

digitally encoded height representative signals covering periodic measurements over a selected period of time;

transfer storage means including a storage medium, and responsive to said first and second monitoring assemblies, for storing height signals of said memory means of said first and second monitoring assemblies; and

conversion means responsive to said transfer storage means for converting said digitally encoded signals derived from said monitoring assemblies to timewise relatable liquid flow rates.

4,344,330

AVERAGE FLUID FLOW SENSOR

Michael J. Renken, Chaseburg, and Billy P. Simmons, La Crosse, both of Wis., assignors to The Trane Company, La Crosse, Wis.

Filed Feb. 13, 1981, Ser. No. 234,284
Int. Cl.³ G01F *1/46*
U.S. Cl. 73—861.66 **6 Claims**

1. A sensor for providing a differential pressure signal indicative of the average relative flow velocity of a fluid through a duct and adapted for connection to a device which is responsive to differential pressure as an indication of fluid flow rate, said sensor comprising

a. first and second tubular members disposed with in the duct, each of which is generally formed in a loop oriented transverse to the direction of fluid flow through the duct; wherein the first and second tubular members comprise a single continuous tubular member each end of which is in fluid communication with the device responsive to differential pressure, said continuous member being sealed at an intermediate point along its length to separate the first and second tubular members defined thereby from fluid communication with each other;

b. means for supporting said first and second tubular members within the duct; and

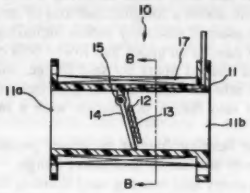
c. a plurality of orifices disposed in spaced apart relationship along the length of each of the tubular members, wherein the orifices in the first tubular member face toward fluid flow impinging from upstream of the duct and the orifices in the second tubular member are disposed facing generally downstream of the fluid flow in the duct, such that the impact fluid pressure developed in the first tubular member is relatively greater than the fluid pressure developed in the second tubular member as a result of the respective orientation of the orifices in each of said tubular members, and the magnitude of this differential pressure is indicative of the average fluid flow rate in the duct.

4,344,331

FLUID FLOW METER

Shinichiro Iwasaki, Auburn Heights, Mich., assignor to Aisin Seiki Company, Limited, Kariya, Japan

Filed Aug. 29, 1980, Ser. No. 182,585
Int. Cl.³ G01F *1/28*
U.S. Cl. 73—861.76 **12 Claims**



11. A fluid flow meter comprising:

a body means having a passage therein for the fluid to flow therethrough;

a movable member pivotably mounted in said passage in said body means and tiltable to open and close said passage in response to the flow rate of the fluid flowing through said passage;

a magnetically soft member fixed onto said movable member and wound with a coil; and

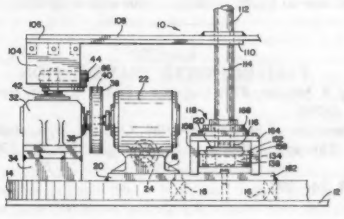
a magnetic field generating means provided on said body means and adapted to generate magnetic flux in a predetermined direction in a range in which said movable member is tiltable.

4,344,332

LOAD BEARING OSCILLATOR DRIVE

Henry A. Schuricht, Pontiac, Mich., assignor to Amsted Industries Incorporated, Chicago, Ill.

Filed Oct. 14, 1980, Ser. No. 196,686
Int. Cl.³ F16H *25/08, 25/16*
U.S. Cl. 74—54 **1 Claim**



1. An oscillator drive particularly adapted to support a vertically imposed load and oscillate such in a cycle having a selective frequency and amplitude, an improvement in said drive comprising:

a source of rotary power,

rotational rate reduction means connected to an output of said power source to produce a rotary output having a substantially reduced rotational rate,

eccentric cam assembly means operatively connected to said rate reduction means rotary output to convert said output to an oscillating output, said means comprising a hub portion having an eccentrically located aperture for disposition of an output shaft of said rate reduction means, a flange portion having an eccentrically located aperture for disposition of an upper post of said hub portion, a bearing carried by said flange portion and a retainer plate fastened to said hub to secure said bearing to said flange,

an angular position of said flange portion relative to said hub portion being adjustable to set an eccentric position of said bearing at varying increments,

a load bearing column operatively connected to said cam assembly means by an elongated member having spaced guide plates in contact with said cam assembly bearing, said column carried by a support journal assembly means to maintain a position of said column in proximate alignment with said load while allowing a free oscillation of said column about a longitudinal axis of said column,

said support journal assembly means including,

a pilot insert having an upper and lower boss connected to a flange and spaced apart by said flange, said upper boss insertable into an open end of said column with a top surface of said flange in contact with a bottom of said column,

a thrust-type bearing having an upper portion in contact with a lower surface of said insert flange,

a housing to carry said bearing, said housing having a circular sidewall forming a lower inner offset to receive a lower portion of said bearing with a loose fit to provide a space for self-centering of said bearing within said lower inner offset, and a retaining ring fastened to said housing sidewall, said ring formed with an aperture for disposition of said insert flange with said aperture having a chamfered edge portion to facilitate a lubricant addition to said housing for said thrust-type bearing, and

a flange-type bearing in contact with said column above said bottom of said column, said flange-type bearing carried by a horizontal support member located above said housing and carried by spaced uprights positioned on each side of said housing,

wherein energization of said power source causes said output shaft of said rate reduction means to rotate said cam assembly at a rate substantially less than a rate of said power source, said cam assembly interacting with said member guide plate to oscillate said column about its longitudinal axis,

wherein said thrust-type bearing supports said load imposed on said column with said thrust-type bearing adjusting in position to align with said load while allowing said column to freely oscillate about its longitudinal axis and said flange-type bearing maintains said longitudinal axis of said column in alignment with said load while allowing said column to freely oscillate about said longitudinal axis.

4,344,333

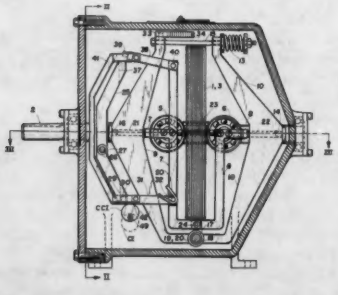
VARIABLE SPEED TRANSMISSION

Stanley J. Mikina, 4782 Coquina Key Dr. SE., St. Petersburg, Fla. 33705

Continuation of Ser. No. 956,084, Oct. 30, 1978, abandoned. This application Jun. 26, 1980, Ser. No. 163,339

Int. Cl.³ F16H *15/08, 15/00, 13/10*

U.S. Cl. 74—199 **7 Claims**



1. In a frictionally driven, continuously variable speed transmission comprising stacks of interleaved laminations mounted on input and output drive shafts, improved means for squeezing together said interleaved laminations so as to develop interlaminar surface friction forces for torque transmission and for setting and controlling the speed ratio, said means comprising a pair of opposed bearing supported, convex surfaced rollers mounted on roller bearing shafts for applying squeezing forces on opposite ends of said lamination stacks and in a direction parallel to said drive shafts on which squeezing forces are applied to said lamination stacks, frames supporting each roller bearing shaft, swivel shafts on which said frames are rotatable on axes parallel to said drive shafts and perpendicular to said roller bearing shafts and intersecting the centers of contact of the convex surfaces of said rollers with end laminations of said interleaved torque transmitting laminations, thrust bearings acting on the end of said shafts and through which said swivel shafts apply the squeezing forces, loading arms in which said swivel shafts and roller bearing shafts are retained and supported, a roller loading spring and its reaction forces acting on one end of said loading arms while the other end terminates in an axially slideable bearing mounted on a guide rod extending in a direction at right angles to said drive shafts and lying in a plane parallel to the plane in which said drive shafts lie, two link members for additionally trying together said roller swivel shafts, said link members extending over the outer rims of said interleaved laminations and engaging each other on one end in a pivoted joint that forces said swivel shafts to move in unison and in the same angular direction, a control bar on a rotating screw movable in a direction perpendicular to said drive shafts and parallel to the planes of laminations for determining the angular displacement of said swivel shafts and attached link members, a U frame serving as the connection between said link members and control member, said U frame straddling said loading arms and being pivoted on a link at one end and having a pin shaft at the other end that engages a slot in the control member, said slot permitting the link and swivel shaft to swivel as said control member that engages sais pin shaft is rectilinearly displaced by said rotating screw, said slot in said control member permitting said swivel shaft to swivel in the direction of reducing the initial angle of swivel as the roller moves to follow the control member displacement, said swivel angular displacement being so chosen that said roller is caused to follow stable negative exponential approach to the final command position of the control member, said follower response being caused by the friction forces arising between the rollers and contacted laminations as a result of the triangle of vector velocities of (a) the peripheral velocity of the laminations, (b) the peripheral velocity of the swivelled contacting roller, and (c) the translation velocity of the link and roller swivel shaft in the direction of the command displacement of said control member.

4,344,334

CHANGE-SPEED TRANSMISSION WITH SPEED-RANGE SELECTION MEANS FOR MOTOR VEHICLES, PARTICULARLY FOR FARM TRACTORS

Klaus Schmittbetz, Cologne, and Karl D. S. Struchtrup, Kettwig, both of Fed. Rep. of Germany, assignors to International Harvester Co., Chicago, Ill.

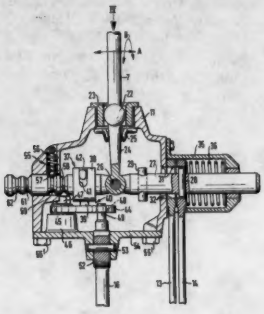
Filed Sep. 11, 1980, Ser. No. 185,861

Int. Cl.³ G05G *9/12*

U.S. Cl. 74—473 R **11 Claims**

1. A gear-shift mechanism for a change-speed transmission equipped with speed-range selection means for motor vehicles, said mechanism **(6)** comprising: a multi-speed gear-shift transmission unit and a range-shift transmission unit; a shift control lever **(7)** actuating via a gear-selector passage **(21)** and via several gear-shift passages a gear-shift shaft **(27)** rotatively supported and axially moveable inside a housing **(11)**; gear-shift levers **(13, 14)** loosely supported on said shaft and lockable in a non-revolving manner; said gear-shift shaft **(27)** including two coupling elements **(28, 29)** co-axially and spatially disposed thereon and alternately moveable into a non-revolving engagement with said gear-shift levers **(13, 14)**; said range-

shift transmission unit being operated by a shifting mechanism (40) controlled by a shift finger (37) mounted on and axially



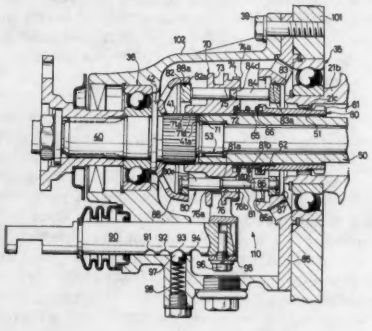
moveable together with said gear-shift shaft; and said finger limitedly rotating about said gear-shift shaft (27) and axially immobile relative thereto.

4,344,335

POWER DISTRIBUTING DEVICE FOR VEHICLES

Shunichi Kawai, Aichi, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 19, 1979, Ser. No. 86,308
Claims priority, application Japan, Oct. 24, 1978, 53/131139
Int. Cl.³ F16H *37/06, 37/08, 3/38;* **F16D** *11/00*
U.S. Cl. 74—674 **2 Claims**



1. A power distributing device for a vehicle comprising:
a nonrotary casing having a stationary internal member;
gear teeth disposed upon said stationary internal portion of said casing;
a plane planetary gear set mounted within said casing;
said planetary gear set comprising a sun gear, a ring gear, a planet carrier and planet gears wherein said planet carrier carries said planet gears such that said planet gears engage said sun gear and said ring gear;
a journal having a plurality of gear teeth provided therein and operatively associated with said planet carrier;
a shaft member operatively associated with said sun gear;
an input shaft drivably engaged with said planet carrier;
a first output shaft connected with said ring gear;
a second output shaft arranged coaxially with said sun gear;
spline teeth peripherally disposed upon said second output shaft;
power train changing means disposed within said nonrotary casing and operatively associated with said planetary gear set;
sliding sleeve means mounted upon and movably engaged with said shaft member and operatively associated with said power train changing means;
first internal spline teeth disposed axially along an inner surface portion of said sliding sleeve means such that said first internal spline teeth selectively engage said spline teeth peripherally disposed upon said second output shaft;
first peripheral gear teeth disposed on an end portion of said sliding sleeve means such that said first peripheral gear teeth selectively engage said gear teeth disposed upon said stationary internal portion of said casing;
said sliding sleeve means having at least a first and second hole formed therein, said first hole defining first and second countersunk end portions adjacent respective surface portions of said sliding sleeve means;
second peripheral gear teeth disposed at an end portion of said sliding sleeve means such that said second peripheral gear teeth selectively engage said gear teeth formed within said journal;
synchronizing means disposed within said nonrotary casing and operatively associated with said power train changing means and which further comprises:
a first contacting surface disposed upon said stationary internal portion of said casing;
a second contacting surface mounted upon said second output shaft;
at least one guide pin loosely mounted within said first hole formed in said sliding sleeve means,
a first contacting element fixed on a first end of said at least one guide pin for selectively contacting said first contacting surface,
a second contacting element fixed on a second end of said guide pin opposite said first end of said guide pin for selectively contacting said second contacting surface;
at least one thrust pin loosely mounted within said second guide hole formed in said sliding sleeve means for selectively pushing said first and second contacting elements against said first and second contacting surfaces, respectively, upon selective movement of said sliding sleeve means;
said guide pin comprising first and second end portions having unequal axial lengths for effecting selective engagement of said first and second contacting elements with said first and second contacting surfaces, respectively, during movement of said sliding sleeve means about said guide pin, an inner axial portion disposed between said end portions and having a diameter less than said end portions, and first and second tapered axial portions disposed between said inner axial portion and said end portions of said guide pin such that said first and second tapered axial portions define a boundary between said inner axial portion and said first and second end portions wherein said first and second tapered axial portions selectively contact said first and second countersunk end portions of said first hole formed in said sliding sleeve means such that movement in a first axial direction of said sliding sleeve means from a neutral non-contacting position effects frictional coupling between said first contacting element and said first contacting surface via engagement of said first tapered axial portion of said guide pin with said first countersunk end portion of said first hole formed in said sliding sleeve means and wherein engagement of said first peripheral gear teeth disposed on said sliding sleeve means with said gear teeth disposed upon said stationary internal portion of said casing locks said sun gear upon further movement of said sliding sleeve in a first direction such that said second output shaft rotates freely without receiving power from said power distributing device, and such that power is transmitted to said second output shaft from said power distributing device, and wherein first movement of said sliding sleeve means from a neutral non-contacting position in a second axial direction opposite said first axial direction effects frictional coupling between said second contacting element and said second contacting surface via engagement of said

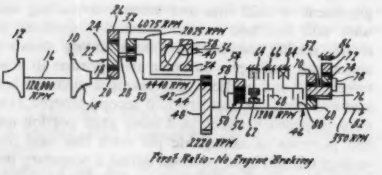
second tapered axial portion of said guide pin with said second countersunk end portion of said sliding sleeve means, and effects engagement of said first internal spline teeth with said spline teeth on said second output shaft and couples said sun gear with said second output shaft such that said planet carrier rotates freely, and wherein further movement of said sliding sleeve means in said second axial direction beyond said first movement in a second axial direction effects engagement of said second peripheral gear teeth disposed on said sliding sleeve means with said gear teeth provided within said journal of said planet carrier and fixes said sun gear with said planet carrier while said sun gear is fixed with said second output shaft such that said first end portion of said guide pin coacts with said sliding sleeve means during said further movement of said sliding sleeve means in a second axial direction such that engagement of said second tapered axial portion of said guide pin with said second countersunk end portion of said sliding sleeve means is prevented by said unequal axial length of said first end portion of said guide pin.

4,344,336

DIFFERENTIAL TRACTION DRIVE WITH EXTREME OVERALL TORQUE RATIOS FOR USE IN A GAS TURBINE ENGINE DRIVELINE

Donald L. Carriere, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 23, 1979, Ser. No. 59,848
Int. Cl.³ F16H *37/06, 37/00*
U.S. Cl. 74—690 **6 Claims**



1. A differential split torque driveline adapted to deliver torque from a high speed driving shaft to a driven member, comprising:

a planetary gear unit having a sun gear, a ring gear and a planet pinion, said planet pinion engaging drivably said sun gear and said ring gear, said sun gear being connected to said driving shaft, a carrier for said pinion, a secondary pinion connected drivably to said first pinion and supported rotatably on said carrier, a second ring gear engaging said second pinion,

a differential torque delivery gear unit with infinitely variable torque ratio characteristics having an input member and an output member with means for establishing a driving relationship therebetween, said first mentioned ring gear being connected to one driving member of said differential unit and said second ring gear being connected to the other member of said differential unit whereby the speed relationship between said ring gears is determined by the speed ratio relationship of the differential unit members, and

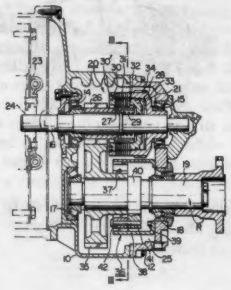
a driven member connected drivably to said carrier.

4,344,337

REDUCTION AND REVERSING GEAR FOR MARINE PROPULSION SYSTEMS

Michisuke Nagasaki, Toyonaka, and Kinichi Aso, Yao, both of Japan, assignors to Yanmar Diesel Engine Co., Ltd., Osaka, Japan

Filed Nov. 13, 1979, Ser. No. 93,812
Int. Cl.³ F16H *37/00, 3/44, 57/10*
U.S. Cl. 74—740 **5 Claims**



1. A reduction and reversing gear for marine propulsion systems, the reduction and reversing gear having: a clutch case, an input shaft mounted on an upper portion of said clutch case, an output shaft mounted at a lower portion of said clutch case and extending in parallel with said input shaft, an ahead unit including a multiple disc clutch mounted on said input shaft and having a clutch housing adapted to rotate unitarily with said input shaft and a small gear mounted on said input shaft and adjacent to said multiple disc clutch, said small gear being adapted to be connected to and disconnected from said input shaft in accordance with the state of said multiple disc clutch, a large gear mounted on said output shaft for engagement with said small gear, and an astern unit disposed in parallel with said ahead unit and including a multiple disc clutch having a clutch housing operatively connected to said clutch housing of said ahead unit and a small gear for engagement with said large gear; wherein the improvement comprises a planetary gear type reduction gear disposed in the space below said multiple disc clutch of said ahead unit, the planetary gear type reduction gear being connected at its one side to said large gear and to said output shaft at its other side, whereby it becomes possible to provide a reduction and reversing gear of a large variety of reduction ratios by making use of a common clutch case for small reduction ratios.

4,344,338

POWER TRANSMISSION DEVICE

Yoshiyuki Hattori, Toyoake; Kazuma Matsui, Toyohashi, and Hiroji Kinbara, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Aug. 30, 1979, Ser. No. 71,102
Claims priority, application Japan, Sep. 4, 1978, 53-108434
Int. Cl.³ F16H *3/74, 3/44;* **F16D** *31/04*
U.S. Cl. 74—752 C **4 Claims**

1. A power transmission device comprising:

a casing with means for connection to an output member;

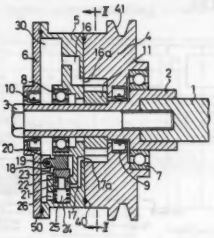
a driving shaft with means for connection to an input member and coaxially disposed within said casing so as to be relatively rotated with said casing;

a driving gear disposed within said casing and coaxially fixed to said driving shaft;

at least two driven gears rotatably supported by said casing and engaged with said driving gear within said casing;

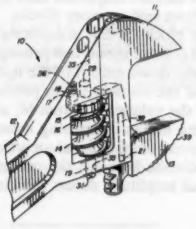
at least two fluid inlet chambers and at least two fluid outlet

chambers formed within said casing with said driving gear and with said at least two driven gears within said casing;
a fluid storage chamber formed within said casing;
a fluid inlet passage and a fluid outlet passage of which one ends are communicated with said at least two fluid inlet chambers and said at least two fluid outlet chambers, respectively and the other ends thereof being communicated with said fluid storage chamber; and
a discharged fluid control device disposed in said fluid outlet passage, said discharged fluid control device being provided with a valve means which closes said fluid outlet



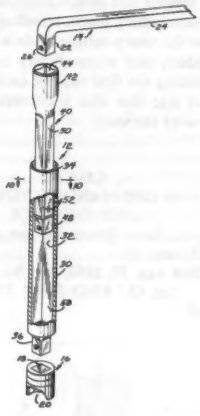
passage at a rotative speed of said casing under a predetermined speed and opens said fluid outlet passage at a rotative speed of said casing above the predetermined speed;
a non-return device disposed in an opening portion of said fluid inlet passage into said fluid storage chamber for preventing the fluid from flowing out of said fluid inlet passage reversely, said non-return device including centrifugal force-activated means for substantially instantaneously opening and closing said fluid inlet passage in dependence upon whether said casing is rotating faster or slower than a predetermined speed.

4,344,339
ADJUSTABLE WRENCH
John Penner, P.O. Box 1348, Avondale, Ariz. 85323
Filed Oct. 6, 1980, Ser. No. 194,081
Int. Cl.³ B25B *13/16*
U.S. Cl. 81—157 **6 Claims**



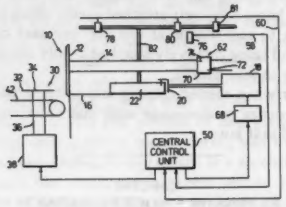
1. An adjustable wrench comprising:
a handle,
a pair of cooperating jaws mounted on said handle,
one of said jaws being fixedly attached to said handle,
the other of said jaws being movably mounted on said handle for cooperating with said one of said jaws and having a toothed edge,
a first opening provided in said handle juxtapositioned to said jaws,
a cylinder having a spiral thread arranged along its outer periphery,
a second opening provided in said cylinder and extending longitudinally therethrough,
a mandrel,
said mandrel comprising a cylindrical portion for fitting into said second opening and a collar at one end thereof positioned off center from the longitudinal axis of said cylindrical portion and extending outside of said second opening,
a third opening extending through said collar and axially aligned with said second opening,
means for mounting said cylinder with said mandrel positioned therein in said first opening with said cylindrical portion being rotatively attached axially along said second opening to said handle at one end and said collar at its other end being rotatively attached axially along said third opening to said handle,
said collar when rotated causing said spiral thread to selectively engage or disengage with said tooth edge on said other of said jaws.

4,344,340
EXTENSIBLE SOCKET WRENCH
Wayne Erickson, Rte. 2, Marseilles, Ill. 61431
Filed Oct. 20, 1980, Ser. No. 198,721
Int. Cl.³ B25G *1/04*
U.S. Cl. 81—177 A **6 Claims**



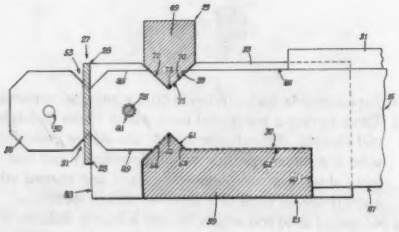
1. An extensible socket wrench comprising, in combination,
a sleeve having a polygonal bore which opens through one end thereof, the opposite end of the sleeve embodying a solid attachment portion which detachably and non-rotatably seats in a complementary sized and shaped attachment recess of each of a series of socket members;
a polygonal solid rod which fits and is axially slidable in said polygonal bore of the sleeve through the open end thereof;
said polygonal solid rod having an enlarged end portion containing an attachment recess in which is non-rotatably received the complementary sized and shaped terminal end of a driver;
the opposite end of the polygonal solid rod containing a spring-biased ball detent which yieldably engages an interior side of the sleeve bore and automatically secures the polygonal solid rod to the sleeve in all positions to which it is adjustable in the sleeve between a maximum and minimum; and
said opposite end of the polygonal rod having an attachment portion of a size and shape complementing the attachment recess of the socket members such that the polygonal solid rod may itself be detachably connected to the socket member and serve to transmit the rotational force of the driver exerted thereon to the socket member.

4,344,341
SLICING APPARATUS
Walter E. Lotz, 904 Atlantic Dr. SE., Pt. Manalapan, Lantana, Fla. 33462
Filed Sep. 4, 1980, Ser. No. 183,874
Int. Cl.³ B26D 5/00
U.S. Cl. 83—29 9 Claims



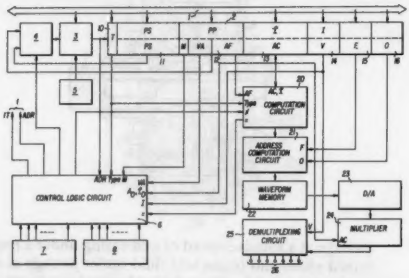
8. A method of thinly slicing friable meat products to produce a stack of slices comprising providing an acircular rotary cutting blade, feeding said product forwardly a preset distance for slicing by said cutting blade, arresting the forward feeding during the time the rotary cutting blade is in substantial contact with said product, and automatically increasing said preset distance for cutting the first slice of each stack, whereby the settling time of said first slice is decreased in comparison to remaining slices of the stack.

4,344,342
METHOD FOR THE MANUFACTURE OF WASHERS AND THE LIKE
George R. Garvin, River Forest, Ill., assignor to Sam Garvin & Company, Chicago, Ill.
Filed Aug. 27, 1980, Ser. No. 181,710
Int. Cl.³ B21D 28/00, 53/00
U.S. Cl. 83—45 7 Claims



1. A method for the manufacture of washers and the like from a strip of sheet material having one straight edge, said method comprising:
positioning said straight edge along a guide means;
notching said sheet by die cutting a pair of opposing V notches through the thickness of said sheet material in such a manner that the legs of one such V notch extend from its vertex to one edge of said sheet material and the legs of the other V notch extend from its vertex to the opposite edge of said sheet material;
simultaneously with said notching step, trimming said sheet material to a predetermined width;
said trimming being carried out by die cutting material from the edge opposite said straight edge to produce a sheet of desired width having parallel edges;
advancing said sheet material in a direction parallel to said straight edge, and
shearing said sheet material at a line joining the vertices of each pair of V notches.

4,344,343
POLYPHONIC DIGITAL SYNTHESIZER OF PERIODIC SIGNALS
Christian T. Deforeit, 202 rue des Joncs-Marins, 91620 La Ville Du Bois, France
Filed Jun. 10, 1980, Ser. No. 158,251
Claims priority, application France, Jun. 15, 1979, 79 15337
Int. Cl.³ G10H 1/00
U.S. Cl. 84—1.01 7 Claims



1. A polyphonic digital synthesizer of periodic signals comprising:
plural generators for generating binary signals of predetermined frequencies;
a set of memory blocks containing amplitude data including current amplitude data and final amplitude data;
control means for reading the memory blocks according to a set sequence as a function of said binary signals;
means for producing analog samples of periodic signals from data read from the memory blocks, comprising;
means for automatic development of the amplitude of each periodic signal, comprising computing means for periodically replacing each current amplitude datum with an updated current amplitude datum computed by interpolation from a current amplitude data and a final amplitude data read from said memory blocks;
each memory block further comprising a validation datum M, and said control means comprising means for disabling the automatic development of the updated current amplitude data of the corresponding periodic signal in case of absence of the validation datum M; and
said computing means comprising means for producing an updated current amplitude datum which is a quasilogarithmic interpolation between the current amplitude datum and the final amplitude datum read in the corresponding block.

4,344,344
ELECTRONIC MUSICAL INSTRUMENT HAVING MUSICAL PERFORMANCE TRAINING SYSTEM
Akira Nakada; Toshio Sugiura, both of Hamamatsu; Eisaku Okamoto, Hamakita, and Kiyoshi Yoshida, Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan
Filed Aug. 18, 1980, Ser. No. 179,261
Claims priority, application Japan, Aug. 31, 1979, 54-111435
Int. Cl.³ G10F 1/00
U.S. Cl. 84—1.03 12 Claims

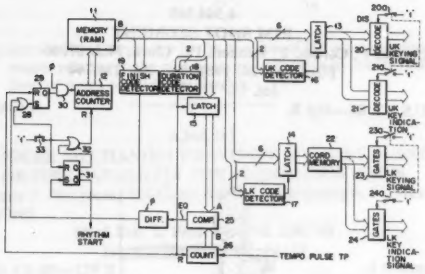
1. An electronic musical instrument comprising:
memory means having memory addresses for storing in the respective addresses performance data constituting the progression of a music piece to be played;
readout control means coupled to said memory means for

reading out, by designating a plurality of respective address locations of said memory means, said performance data at a selectable tempo;

keyboard means having keys and means responsive to depression of a key to produce a keying signal corresponding to the depressed key;

key indicating means coupled to said memory means and being responsive to a part of said performance data read out of said memory means to indicate a key to be depressed on said keyboard means;

tone signal producing means coupled to said keyboard means and responsive to said keying signal to produce a musical tone signal corresponding to said depressed key of



said keyboard means so that a musical performance is effected on said keyboard means by depressing keys indicated by said key indicating means;

automatic tone signal forming means coupled to said memory means and being responsive to a part of said performance data read out of said memory means for effecting an automatic musical performance of a different type from said musical performance effected on said keyboard means by depression of keys indicated by said key indicating means; and

means coupled to said key indicating means and to said automatic tone signal forming means for operating said key indicating means and said automatic tone signal forming means in timed relation to each other.

4,344,345

AUTOMATIC RHYTHM ACCOMPANIMENT SYSTEM

Shigenori Sano, Higashiyamato, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1980, Ser. No. 215,756
Claims priority, application Japan, Dec. 26, 1979, 54-169561
Int. Cl.³ G10F *1/00*
U.S. Cl. 84—1.03 **6 Claims**

1. An automatic rhythm accompaniment system comprising:

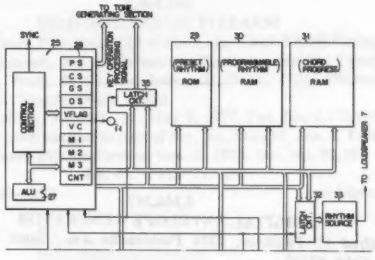
first memory means for storing a plurality of rhythm pattern data items;

selecting means for selecting one of the rhythm pattern data items stored in said first memory means;

rhythm sound generating means coupled with said first memory means for generating rhythm sounds in accordance with a rhythm pattern data item selected by said selecting means and read out from said first memory means;

second memory means for storing chord progress data and control data, said control data being stored in said second memory means in accordance with said chord progress data;

accompaniment sound generating means coupled with said second memory means for generating accompaniment sounds according to said chord progress data; and



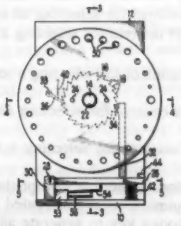
control means coupled to said first and second memory means and being responsive to stored control data derived from said second memory means for reading out from said first memory means a rhythm pattern data item other than said rhythm data item selected by said selecting means, and for supplying said other rhythm pattern data item to said rhythm sound generating means to generate rhythm sounds according to said other rhythm pattern data item.

4,344,346

MUSICAL LIGHT TOY

Erick E. Erickson, Chicago, and Gunars Licitis, Sr., Lombard, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

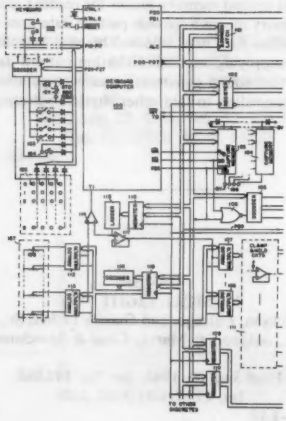
Filed Sep. 29, 1980, Ser. No. 192,085
Int. Cl.³ G10H *3/06, 3/03*
U.S. Cl. 84—1.18 **12 Claims**



1. A musical toy, comprising a rotatably mounted disc having a series of openings therethrough which are equally spaced

apart at a common radius from the center thereof, the cross-sectional area of successive ones of said openings corresponding to the pitch of successive notes of a musical selection when said disc is rotated in a predetermined direction, means for advancing said disc by successive increments equal to the space between successive ones of said openings, light sensitive means mounted to receive light through successive ones of said openings as said disc is successively advanced by said advancing means, and means connected to said light sensitive means for generating an audible tone having a pitch which varies in accordance with the cross-sectional area of successive ones of said openings.

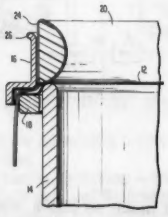
4,344,347
DIGITAL ENVELOPE GENERATOR
Alfred H. Faulkner, 1324 Portesuello Ave., Santa Barbara, Calif. 93105
Filed Mar. 26, 1980, Ser. No. 134,248
Int. Cl.³ G10H *1/02*; G06F *1/02*
U.S. Cl. 84—1.26 **13 Claims**



1. A keyboard musical instrument including;
a first preset control for selecting an envelope attack rate,
a second preset control for selecting a first envelope decay rate,
a third preset control for selecting a second envelope decay rate,
a fourth preset control for selecting an envelope breakpoint level,
a fifth preset control for selecting a third envelope decay rate, and
a digital envelope generator comprising;
a first programmatic means activated in response to operation of a playing key to generate an envelope having the selected attack rate,
a second programmatic means activated by said first means upon termination of the attack phase to continue generation of the envelope at the selected first decay rate,
a third programmatic means activated in response to the envelope reaching the selected breakpoint level to continue generation of the envelope at the selected second rate, and
a fourth programmatic means activated in response to release of the playing key to complete generation of the envelope at the selected third decay rate.

4,344,348
Patent Not Issued For This Number

4,344,349
RIM SHOT SEGMENT
Charles P. Cordes, 27 Kenneth Pl., Clark, N.J. 07066
Filed Jun. 24, 1981, Ser. No. 276,744
Int. Cl.³ G10D *13/02*
U.S. Cl. 84—411 R **4 Claims**



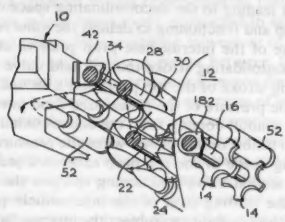
1. A rim shot segment adapted to be attached to a drum in contact with the drum head and internal circumferential surface of the drum hoop comprising an arcuate segment of plastics material having a semi-cylindrical cross-sectional configuration including a flat surface and a rounded surface and means for securing said arcuate segment to a drum with said flat surface bearing against the internal circumferential surface of the drum hoop and a portion of the rounded surface bearing against the drum head where the drum head engages the drum shell.

4,344,350
CROSSFEEDER
Michael D. Golden, Costa Mesa, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.
Filed Nov. 13, 1979, Ser. No. 93,727
Int. Cl.³ F41D *10/42*
U.S. Cl. 89—33 E **30 Claims**

1. A crossfeeder unit capable of constant supply rate and variable output rate of serially provided items comprising:
a support structure;
discharge means for discharging items from the unit;
input means means for item input to the unit;
intermediate means for accumulation of a variable number of items between the input and discharge means, the intermediate means including at least one pivotable accumulating

means mounted to pivot about the axis of at least one of the input and discharge means in accordance with differences between the supply rate and the output rate;

guide means for guiding said items from the input means to the output means via the intermediate means; and



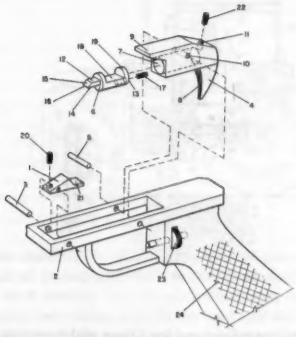
control means responsive to the position of the accumulating means relative to the pivot axis and effective to control the feed of items to said crossfeeder.

4,344,351

TRIGGER MECHANISM PROVIDING A SHORT BURST OF FIRE CAPABILITY FOR SUBMACHINE GUNS

Sidney J. McQueen, 414 Coors Rd. SW., Albuquerque, N. Mex. 87105

Filed Feb. 2, 1981, Ser. No. 230,740
Int. Cl.³ F41D *11/02, 11/10*
U.S. Cl. 89—129 B **2 Claims**



1. A trigger mechanism providing a burst capability in automatic weapons comprising:

a trigger pivotally mounted in a trigger frame, said trigger having a sear lever, a finger lever, and a transverse pivot hole; and

said trigger having a finger bore essentially parallel to and adjacent to the sear lever, said finger bore intersecting the pivot hole; and

said trigger having a spring hole extending from the top of the trigger down into the finger lever; and

a burst finger sized to slideably fit the finger bore; said burst finger having a sear tip which has a lower flat surface, and a beveled upper surface, forming a relatively sharp edge at the sear tip; and

said burst finger having a butt end; and said burst finger having a longitudinal cavity in the upper portion of the body of the burst finger, adjacent to the butt end, said longitudinal cavity being sized to slideably permit a trigger pin to be installed in the transverse pivot hole; and

a sear being pivotally mounted in the trigger frame, said sear having a trigger tang; and

a biasing spring installed in the burst finger said biasing spring bearing on the bottom of the finger bore, and said burst finger extending toward the trigger tang on the sear sufficiently to engage said trigger tang on the sear, and

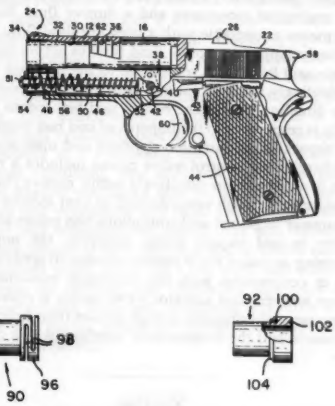
a return spring installed in the spring hole said return spring biasing the trigger to return to the non-firing position.

4,344,352

SEMI-AUTOMATIC FIREARM

Patrick Yates, P.O. Box 5779, China Lake, Calif. 93555; Sydney H. Woodcock, 3rd & University, Penthouse Seattle Tower, Seattle, Wash. 98101, and Jeffrey R. Beals, 11216 Phinney Ave., N., Seattle, Wash. 98133

Division of Ser. No. 794,738, May 9, 1977, Pat. No. 4,173,169, which is a continuation-in-part of Ser. No. 692,297, Jun. 3, 1976, abandoned. This application Nov. 5, 1979, Ser. No. 91,187
Int. Cl.³ F41D *11/12*
U.S. Cl. 89—198 **3 Claims**

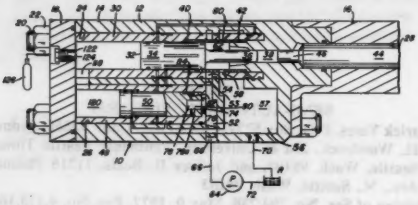


1. In a semi-automatic firearm having a firing chamber, a barrel, a frame, a slide movable with respect to said barrel and said frame between battery and full recoil positions, means for sequentially ejecting a spent cartridge and loading a fresh cartridge during each recoil stroke, and a firing mechanism for selectively initiating said cartridge when said slide is in battery, the improvement comprising a recoil mechanism for allowing the recoil of said cartridge to carry said slide rearwardly toward said full recoil position, and for subsequently returning said slide to its battery position, said recoil mechanism including a first recoil spring extending between said frame and slide to urge said slide toward its battery position, and a second, larger diameter, recoil spring extending between said frame and slide to urge said slide toward its battery position, said second spring concentrically surrounding said first recoil spring, said first and second springs being helically wound in opposite direction such that said first spring forms a guide for said second spring while allowing said springs to deform without interfering with each other, the forward ends of said recoil springs being received by a cylindrical cap having a rear face that contacts a portion of said frame when said slide is in full recoil position, said cap including resilient means for allowing limited relative movement between the front face of said cap and said slide when said slide is in full recoil position.

4,344,353
HAMMER

John Duff, and Peter McFarlane, both of North Bay, Canada, assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Continuation of Ser. No. 39,051, May 14, 1979, abandoned. This application May 18, 1981, Ser. No. 264,495
Int. Cl.³ F01L *17/00, 25/06*
U.S. Cl. 91—165 19 Claims

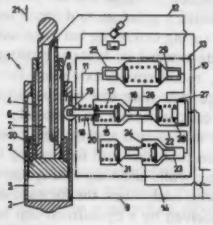


1. In a fluid operable impactor assembly including a reciprocably movable hammer, an independent bias means which continuously exerts on said movable hammer a bias of a magnitude determined solely by the position of said movable hammer in its reciprocal movement and a motive fluid flow control valve means cooperable with a pressure fluid flow source for selectively supplying motive fluid flow to act on said hammer wherein said hammer is responsive to the pressure impetus of the selectively supplied motive fluid flow to move in an upstroke direction against the bias of said bias means and subsequently is responsive to the impetus of said bias means to move in an impact stroke direction opposite said upstroke direction and wherein said control valve means includes a main valve which is actuatable to selectively admit motive fluid flow to said hammer for such upstroke and to vent motive fluid from said hammer to permit said continuous bias means to drive said hammer in said impact stroke direction, the improvement comprising: actuator valve means operable to actuate said main valve in conjunction with the reciprocal movement of said hammer wherein said actuator valve means is operable solely in response to the pressure of such motive fluid from such fluid flow source and the independent, continuous bias of said bias means.

4,344,354
VALVE ARRANGEMENT FOR CONTROLLING THE STROKE OF A TELESCOPING PROP

Heinrich Suessenbeck, Zeltweg; Gottfried Siebenhofer, Vienna; Rienhard Neuper, Judenburg, and Alfred Zitz, Zeltweg, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Vienna, Austria

Filed Feb. 14, 1980, Ser. No. 121,583
Claims priority, application Austria, Mar. 14, 1979, 1919/79
Int. Cl.³ F15B *11/18*
U.S. Cl. 91—168 9 Claims

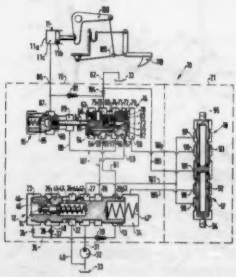


1. Valve arrangement for controlling the stroke of a telescoping prop comprising a stationary base prop, an intermediate prop guided in said base prop, said intermediate prop having a consolidating space and a deconsolidating space and being capable of effecting a mine roof consolidating stroke, at least one top prop guided in said intermediate prop, said top prop having a consolidating space and a deconsolidating space, at least one first valve controlled in dependence on the shifting path of the intermediate prop, said valve being provided in a first conduit leading to the deconsolidating space of the intermediate prop and functioning to delimit the mine roof consolidating stroke of the intermediate prop prior to attaining the maximum consolidating stroke thereof, said valve also releasing the lifting stroke of the top prop, and a second valve controlled by the pressure of the pressurized fluid interpositioned in a second conduit coming from the deconsolidating space of the top prop for becoming closed when the pressure within the consolidating space of the top prop exceeds a predetermined value, said second valve functioning to open the valve controlled by the shifting path of the intermediate prop and to provide for the possibility to subject the intermediate prop to a mine roof supporting pressure exceeding the predetermined pressure of said second valve.

4,344,355
CONTROL ARRANGEMENT FOR A HYDRAULICALLY OPERATED IMPLEMENT

Günter Schwerin, Möglingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 10, 1980, Ser. No. 167,320
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1979, 2929232
Int. Cl.³ F15B *13/042, 13/043*
U.S. Cl. 91—445 8 Claims



1. A control arrangement for lifting and lowering an implement comprising a cylinder and a piston movable in said cylinder and defining in said cylinder to one side of said piston a compartment; linkage means between said piston and said implement for lifting the latter upon feeding of pressure fluid into said compartment and for lowering said implement upon discharge of pressure fluid from said compartment; a source of pressure fluid; a tank; first valve means; second valve means arranged downstream of said first valve means; conduit means comprising an inlet conduit leading from said source to said first valve means, a working conduit leading from said first valve means to said second valve means, a consumer conduit leading from said second valve means to said compartment, a discharge conduit leading from said first valve means to said tank and a return conduit leading from said second valve means likewise to said tank, said first valve means comprising a reversing valve having a reversing slide movable between a first position connecting said inlet conduit to said working conduit and a second position connecting said inlet conduit to said discharge conduit, said second valve means comprising a releasing valve and a stop valve coordinated therewith, said releasing valve having a damping chamber at one end, a control space at the other end and a releasing piston movable between a first position permitting flow of pressure fluid over

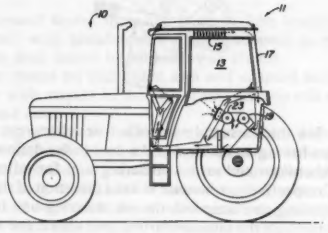
a section of said working conduit downstream of said releasing valve to said stop valve and from the latter through said consumer conduit to said compartment to lift said implement and a second position connecting said compartment to said return conduit to lower said implement; a throttle means connecting said damping chamber to said return conduit; first and second control valve means respectively connected to said reversing and releasing valves for controlling movement of said reversing slide and of said releasing piston between the positions thereof; and pressure peak preventing means for preventing pressure peaks in the conduit means upstream of said releasing piston and comprising passage means connecting a portion of said working conduit upstream of said releasing valve with said damping chamber only when said releasing piston is in said second position and a pressure responsive valve in said passage means controlled in dependence on the pressure prevailing in said working conduit upstream of said releasing valve to communicate fluid from said working conduit to said damping chamber.

4,344,356

AIR DISTRIBUTION SYSTEM

Robert H. Casterton; Larry J. Phippen, and Darrell L. Wright, all of Waterloo, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jun. 23, 1980, Ser. No. 162,402
Int. Cl.³ B60H *3/06*
U.S. Cl. 98—2.11 **10 Claims**



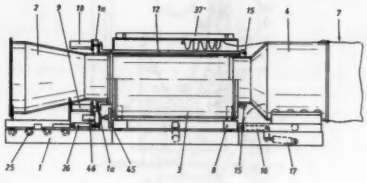
1. An air distribution system for a vehicle cab comprising:
(a) a pair of spaced-apart hollow members contained in said cab, each having two separate chambers, one chamber structure providing support for said cab and the second chamber providing an air channel for incoming air and which communicates with an opening in said cab;
(b) a partition dividing an internal area of said cab into a first compartment and an air mixing zone;
(c) constant-volume blower means for drawing fresh air through said second chamber of each of said hollow members and into said mixing zone and maintaining a positive pressure therein;
(d) a first air filter positioned upstream of said constant volume blower means for filtering the incoming air;
(e) hollow ductwork extending through said partition for routing air from said mixing zone to said first compartment;
(f) variable-speed blower means for recirculating the air from said first compartment into said mixing zone wherein the air is mixed with the incoming fresh air;
(g) a second air filter positioned upstream of said variable-speed blower means for filtering the air from said first compartment; and
(h) a temperature controller positioned downstream of both said constant-volume blower means and said variable-speed blower means and adjacent to an entrance to said hollow ductwork for conditioning the air passing therethrough.

4,344,357

APPARATUS FOR EXTENDING VENTILATING CONDUITS

Alfred Mittelkötter, Witten, Fed. Rep. of Germany, assignor to Ruhrkohle AG and Maschinenfabrik Korfmann GmbH, both of, Fed. Rep. of Germany

Filed Sep. 2, 1980, Ser. No. 183,032
Claims priority, application Fed. Rep. of Germany, May 27, 1980, 3020121
Int. Cl.³ E21F *1/08*
U.S. Cl. 98—50 **29 Claims**



1. Apparatus for guiding and extending ventilating conduits, said apparatus comprising: a replaceable ventilating pipe store having an upstream end and a downstream end and being exchangeable when empty with a full ventilating pipe store, a funnel guide releasably connected to said upstream end of said ventilating pipe store, an outlet nozzle releasably connected to said downstream end of said ventilating pipe store, a flexible ventilating pipe withdrawably accommodated in a folded condition on said ventilating pipe store and having an upstream end connectable to a ventilating conduit, and a main frame carrying said ventilating pipe store and said funnel guide to enable said flexible ventilating pipe to be progressively withdrawn from said ventilating pipe store and extended along an axial line of said apparatus and guided over said funnel guide during advancement of said apparatus and to enable said store to be exchanged when empty for a full store, said main frame having means for carrying said ventilating pipe store except during those periods when said ventilating pipe store is being exchanged and having means for carrying said funnel guide only during said periods.

4,344,358

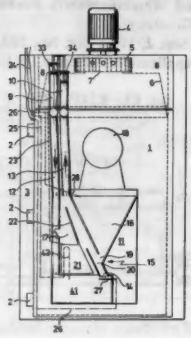
PROCESSING CHAMBER, IN PARTICULAR SMOKING CHAMBER

Siegfried Maurer, Forellenweg 1, 7752 Insel Reichenau, Fed. Rep. of Germany

Continuation of Ser. No. 60,386, Jul. 25, 1979, abandoned. This application Jun. 10, 1981, Ser. No. 272,175
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1978, 2833949; Jan. 2, 1979, 2900012; Apr. 20, 1979, 2915960
Int. Cl.³ A23B *4/04*
U.S. Cl. 99—476 **12 Claims**

1. Apparatus for the processing of food by means of at least smoke, comprising a housing; a partition within said housing separating the interior thereof into a distribution region and a food processing chamber; fluid circulating means mounted in said housing and having an inlet and outlet communicating with said distribution region and said food processing chamber; a door pivotably carried by said housing and sufficiently large for introduction and removal of food; means for generating smoke carried by said door for pivotal movement therewith; a first pair of conduit means carried by said housing and having one end extending therefrom outwardly of said housing, a second pair of conduit means carried by said door and having one end extending into said means for generating smoke, the other ends of said first and second pairs of conduit means being connectable on closing of said door to form two passages for the inlet of air to and the outlet of air from said smoke generating means; in said first pair of conduit means the conduit forming the air inlet passage having a section open

adjacent the outlet of said fluid circulating means and the conduit forming the exhaust passage having a section open adjacent the inlet of said fluid circulating means, whereby the



smoke is circulatable by said fluid circulating means from said smoke generating means through said food processing chamber and is recycled to said smoke generating means.

4,344,359

AUTOMATIC MACHINE FOR PEELING HARD-BOILED EGGS

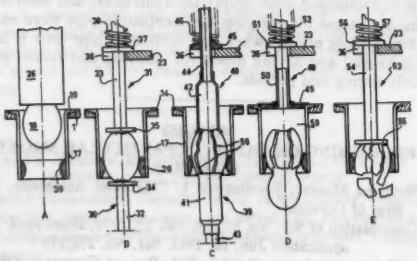
Jerome Frechou, 17 Quai de l'Ile du Bac, 78700 Conflans Saint Honorine, and Gilles Isambert, 65 Bis Rue de Marolles, 94470 Boissy Saint Leger, both of France

Filed May 7, 1980, Ser. No. 147,605

Claims priority, application France, May 15, 1979, 79 12326

Int. Cl.³ A23N *5/00*; A47J *43/14*

U.S. Cl. 99—580 **17 Claims**



1. An automatic machine for peeling hard-boiled eggs comprising

(A) a carrier frame;

(B) a plurality of hard-boiled egg receiver cups, each of said cups having an inlet orifice and a bottom defining a constricted circular opening whose diameter is slightly less than that of the largest diameter egg;

(C) a source of compressed fluid;

(D) a movable stand carrying said cups;

(E) drive means for driving said stand;

(F) a feeding station provided with dispenser means for delivering a hard-boiled egg to one of said cups presented thereto;

(G) break means for breaking the shell of the egg at each end thereof;

(H) shattering means operatively connected to said source of compressed fluid for injecting said compressed fluid under pressure inside the shell between the membrane and the white of the egg to shatter the shell;

(I) ejection means operatively connected to said source of compressed fluid for hermetically sealing off the inlet orifice of said cup and putting the interior thereof under sufficient pressure to drive the white of the egg out of its shattered shell through said constricted circular opening of said cup, and

(J) a cleaning station provided with cleaner means for driving the shattered shell out of said cup.

4,344,360

INK DUCT FOR OFFSET OR LETTERPRESS PRINTING MACHINES

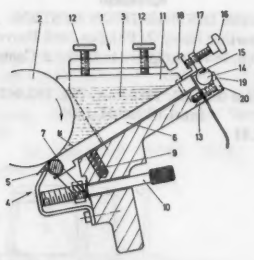
Willi Jeschke, Heidelberg, and Rudi Jünghans, Wilhelmsfeld, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

Filed Jul. 11, 1980, Ser. No. 167,401

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1979, 2928125

Int. Cl.³ B41F *31/02*

U.S. Cl. 101—363 **2 Claims**



1. Ink duct assembly for offset or letterpress printing machines having an ink duct and a duct roller defining an ink gap therebetween and an ink metering unit for adjusting the ink gap, respectively, zonewise in axial direction of the duct roller, comprising an elastic foil, the ink metering unit being engageable through the intermediary of said elastic foil with the duct roller, said elastic foil covering the ink metering unit and being removably fastened to the ink duct at an upper edge thereof, and means for tangentially displacing said elastic foil relative to the duct roller to a position wherein a new and unworn part of the surface of said elastic foil engages with the duct roller, said means for tangentially displacing said elastic foil including a plurality of parallel strips disposed in an upper region of the ink duct and extending over the length of the latter for respectively securing an end of said elastic foil.

4,344,361

AUTOMATIC BLANKET CYLINDER CLEANER

John MacPhee, Rowayton, Conn.; Charles R. Gasparrini, Rye, N.Y., and Karlheinz E. H. Arnolds, Stamford, Conn., assignors to Baldwin-Gegenheimer Corporation, Stamford, Conn.

Filed Apr. 19, 1979, Ser. No. 31,511

Int. Cl.³ B41F *35/06*; B41L *41/06*

U.S. Cl. 101—425 **12 Claims**

1. A device for cleaning the rotating blanket cylinder of a printing press with a cleaning fabric comprising:

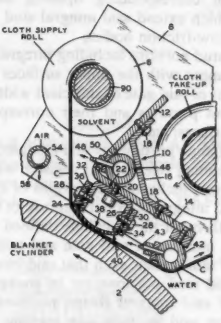
(a) frame means adjacent said blanket cylinder;

(b) means supported by said frame including a cloth supply roll and a cloth take-up roll for mounting the cleaning cloth adjacent said blanket cylinder;

(c) feeding means cooperating with said take-up roll for incrementally feeding substantially the same amount of cloth during each incremental feeding of the fabric regardless of the amount of cloth on the take-up roll;

(d) means for moving the cloth in a direction opposite from the blanket cylinder;

(e) an expandable bladder on said frame which causes the cleaning fabric to contact the blanket cylinder when in the expanded condition;
(f) pneumatic means for expanding said bladder;
(g) said feeding means including power means attached to said frame;
(h) one-way clutch means operatively associated with said power means to drive said take-up roller in one direction;
(i) control means in engagement with the cleaning cloth on said take-up roll, said control means controlling the amount of angular movement of said take-up roll depending on the amount of cleaning cloth on said cleaning cloth take-up roll;



(j) said control means including a crank arm operatively associated with said one-way clutch adapted to rotate with the shaft driven by said one-way clutch;
(k) carrier means on said crank arm and adapted to move radially with respect to the axis of said take-up roll along said crank arm;
(l) travelling pin means operatively associated with said carrier, said travelling pin being maintained in engagement with the cleaning cloth on said take-up roll and being adapted more radially with respect to the axis of said take-up roll with said carrier means and being adapted to be move in an arcuate path with said carrier means about the axis of said take-up roll; and
(m) stop means on said frame adapted to engage said travelling pin and to limit rotational movement.

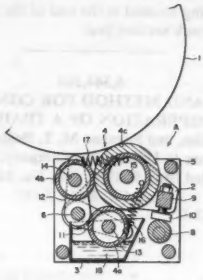
4,344,362

IMPRESSION CYLINDER CLEANING DEVICE FOR PRINTING MACHINE

Koji Ishii, Fuchu, Japan, assignor to Ryobi Ltd., Hiroshima, Japan

Filed Jan. 2, 1981, Ser. No. 222,225
Claims priority, application Japan, Jan. 8, 1980, 55-842[U]
Int. Cl.³ B41F *35/00*
U.S. Cl. 101—425 **7 Claims**

1. A printing machine having an impression cylinder cleaning device comprising:
a cleaning mechanism having a cleaning tank, a group of rollers and auxiliary frames, said group of rollers being rotatably supported by said auxiliary frames and said rollers being in contact with one another, said group of rollers including a cleaning roller; main frames for rotatably supporting said auxiliary frames; a first lever for rotating said auxiliary frames relative to said main frames so that said cleaning roller is brought into or out of engagement with an impression cylinder of said printing machine by operating said first lever;
a printing machine frame having a window formed therein below said impression cylinder; a plurality of guide bars, one of said guide bars extending below said window supported by said printing machine frame; a bracket coupled to said printing machine frame adapted to receive a portion of said main frame; a shaft and a second lever coupled to said shaft, said shaft being coupled to said printing machine frame for detachably positioning said cleaning mechanism below said impression cylinder; and
a cleaning mechanism positioning device having a first adjusting screw adapted to support a lower edge of one of said main frames, a lifting lever having one end pivotally



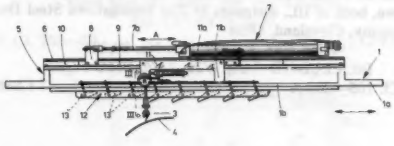
secured to said printing machine frame and said first adjusting screw being threadably engaged with the other end thereof so that said portion of said main frame is fixedly abutted against a lower surface of said bracket or released therefrom; and an arm fixedly secured to said shaft at one end and rotatably coupled through a link to said lifting lever.

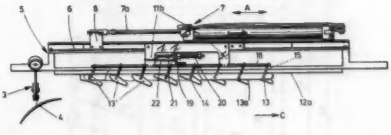
4,344,363

CONVEYOR APPARATUS, PARTICULARLY FOR OVERHEAD CONVEYANCE

Gustav G. Veith, Munich, Fed. Rep. of Germany, assignor to Gustav Georg Veith GmbH & Co., KG and Veith Transpo GmbH, both of Munich, Fed. Rep. of Germany

Filed Apr. 14, 1980, Ser. No. 140,318
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1979, 2915095
Int. Cl.³ B61B *13/12*
U.S. Cl. 104—162 **6 Claims**





1. A conveyor apparatus particularly for intra-plant conveyance in the garment industry, comprising conveyor tracks, carrier units travelling on said conveyor tracks and having each at least one stirrup member straddling a conveyor track from below and provided with rollers resting on the top surface of said track, and at least one drive unit for actively conveying said carrier units, characterized in that said drive unit (2) comprises a conveying bar (12) actuatable to reciprocate along a track section (1*a*) and carrying a plurality of drive transmitting members (13) for engagement with said carrier

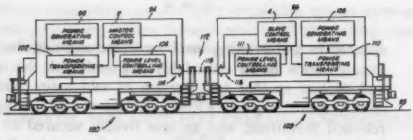
units (3), said drive transmitting members being operative when moving in one working stroke direction to convey said carrier units while being able to pass said carrier units without engagement therewith when moving in the return stroke direction, said track section (1c, 1a) being adapted to receive said carrier units (3) from only one end thereof and said conveying bar (12) being provided with one or more one-armed pawls (13') at the end portion of the conveying bar facing towards the said one end of said track section, the one arm of said one-armed pawls being located at the end of the pawls facing away from said one track section end.

4,344,364

APPARATUS AND METHOD FOR CONSERVING FUEL IN THE OPERATION OF A TRAIN CONSIST

Stephen K. Nickles, and Suzanne M. T. Beaird, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed May 9, 1980, Ser. No. 148,523
Int. Cl.³ B61C *5/00*
U.S. Cl. 105—62 R **30 Claims**



1. An apparatus, responsive to the setting of a throttle means in a master locomotive, for controlling a throttle means of a slave locomotive in a train consist including the master locomotive and the slave locomotive, said apparatus comprising:

means for detecting the setting of the throttle means of the master locomotive; and

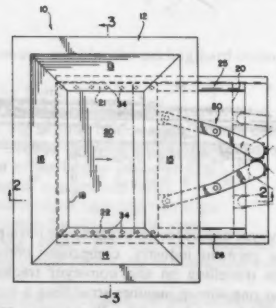
means, responsive to said detecting means, for operating the throttle means of the slave locomotive at an optimum power output-to-fuel consumption ratio within a predetermined range of power levels.

4,344,365

RAILWAY HOPPER CAR GATE ANTI-FRICTION SEAL

William E. Fritz, Naperville, and Thomas C. Soddy, Downers Grove, both of Ill., assignors to The Youngstown Steel Door Company, Cleveland, Ohio

Filed Nov. 1, 1979, Ser. No. 90,301
Int. Cl.³ B61D *7/20, 7/22, 7/26;* **F16C** *17/26*
U.S. Cl. 105—282 A **7 Claims**



1. In a discharge outlet assembly including in combination: a hopper having downwardly inclined side and end walls defining a discharge opening, a discharge chute having inclined side walls and end walls secured to said hopper and extending below said discharge opening, a gate for closing said discharge opening having upturned inclined side margins underlying the lower portions of said side walls of said hopper, the improvement comprising:

elongated low-friction bodies secured parallel to the direction of travel of the gate between the underside of the upturned inclined side margins of the gate and the top sides of the inclined side walls of the discharge chute to enhance selective relative sliding movement of the gate between its open and closed positions;

said elongated low-friction bodies having a plurality of integral stud portions extending transversely to their lengths;

said upturned inclined side margins of said gate including a plurality of corresponding opening defining surfaces through which extend said integral stud portions of said elongated low-friction bodies;

said integral stud portions including integral flange portions for engagement with the upper surfaces of said inclined side margins of said gate of sufficient width to overlie said integral stud portions and their corresponding opening defining surfaces; and

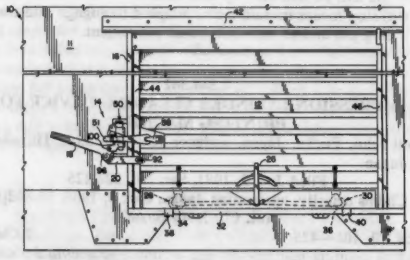
said integral flange portions of said elongated bodies having surfaces defining openings in register with the openings defined in said inclined side margins of said gate and the ends of said integral stud portions are of sufficient length to extend through the openings defined in both said inclined side margins of said gate and said integral flange portions of said bodies, such that said integral flange portions of said stud portions are in engagement with the surfaces of said integral flange portions of said bodies remote from said inclined side margins of said gate to prevent their free passage through the openings of both said inclined side margins of said gate and said integral flange portions of said bodies.

4,344,366

RAILWAY CAR DOOR DRIVER

Thorvald Madland, Arlington Hts., Ill., assignor to The Youngstown Steel Door Company, Cleveland, Ohio

Filed Nov. 28, 1979, Ser. No. 98,297
Int. Cl.³ B61D *3/00, 17/00, 19/00;* **E05F** *13/02*
U.S. Cl. 105—378 **6 Claims**



1. A door driver in combination with a door lock for a railway house car door including:

a door lock hasp having a vertical opening therethrough mounted on the railway house car door,

door lock upper and lower brackets mounted on a house car adjacent to the railway house car door having vertical openings therethrough to register with the vertical opening of said hasp,

a locking pin for common engagement with said upper and lower brackets and said door lock hasp when the railway house car door is in a closed position and the vertical openings therethrough define a common substantially vertical passageway through which said locking pin extends to lock the door in a closed position,

the improved door driver comprising:

a lever pivotally mounted at a point to the lower bracket of the door lock adjacent to the railway house car door such that with the railway house car door in a closed position, said lever is in a substantially horizontal position;

said lever having a crank arm extending therebelow to provide a mechanical advantage upon pivotal movement of said lever through a substantially acute angle; and

an horizontal door latch member pivotally connectable to the railway house car door and to said lever at pivot points spaced below the pivot point of said lever for driving the railway house car door longitudinally upon counter-clockwise rotational movement of said lever between closed and partially open positions.

4,344,367

MODULAR PRODUCT DISPLAY SYSTEM

Milton J. Merl, New City, N.Y., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Aug. 5, 1980, Ser. No. 175,559
Int. Cl.³ A47F *5/12*
U.S. Cl. 108—1 **44 Claims**

1. A modular product display system comprising:

a base assembly;

at least two spaced apart upright supporting webs detachably connected to said base assembly;

a plurality of shelf assemblies positioned for support between said webs;

bracket means detachably connected to said webs for adjustably supporting said shelf assemblies between said webs, and means carried by said brackets for detachably engaging said shelf assemblies;

said webs including an arrangement of keyhole slots on at least one side thereof including a row of central keyhole slots having their axes aligned with each other and parallel to the longitudinal axis of said webs, and at least a first row of side keyhole slots having their axes parallel to each other and oriented at an angle of between 5° and 15° with respect to the longitudinal axis of said web; and

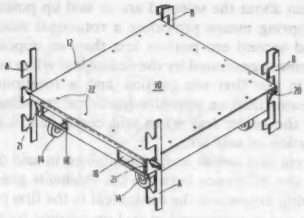
said bracket means including a mounting plate, upper and lower connector elements carried by said mounting plate for coupling with said keyhole slots to support said bracket on said web, and at least one upwardly extending tab member for detachably engaging a support element of said shelf, said upper and lower connector elements being positionable in either said central or side keyhole slots for supporting said shelf assemblies in a horizontal or tilted condition.

4,344,368

UNIVERSAL PALLET

John L. Remington, Coplay, and Robert W. Moyer, Allentown, both of Pa., assignors to The Stanley Works, New Britain, Conn.

Filed Jul. 2, 1980, Ser. No. 165,278
Int. Cl.³ B65D *19/28, 19/44*
U.S. Cl. 108—51.1 **9 Claims**



1. In combination:

a stationary support means, and

a universal pallet for the storage of goods, said pallet comprising:

a generally planar upper surface, comprising means for affixation of selected superstructure means chosen for the convenient storage of classes of goods; and

a base, said base comprising hook and bar means adapted to mate with said support means for storing said pallet, and means for mating with transport means;

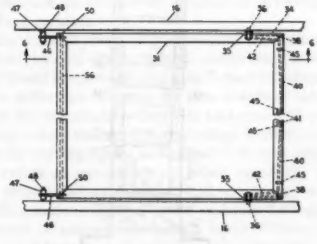
said support means comprising front and rear upright support means, said front upright support means comprising a plurality of spaced vertically opening notches for mating with said hook means on said pallet, and said rear upright support means comprising a plurality of similarly spaced horizontally opening notches for engagement with said bar means.

4,344,369

TABLE WITH EXTENSIBLE TOP

Andrew J. Van Noord, 1434 Hillsboro, SE., Grand Rapids, Mich. 49506

Filed Mar. 31, 1980, Ser. No. 135,876
Int. Cl.³ A47B *1/00*
U.S. Cl. 108—84 **12 Claims**



1. A table having an extensible top surface comprising:

a frame;

a top surface including end leaves slidably mounted to said frame;

said end leaves slidable between a closed position wherein said leaves are positioned adjacent each other to form said top surface and an open position wherein said leaves are spaced apart to permit insertion of an extension surface;

said extension surface including a center leaf carried on said frame and displaceable between a down position wherein

said center leaf is stored below said top surface when the end leaves are in the closed position and an up position wherein said center leaf forms a portion of said top surface when said end leaves are in the open position;

linkage means for operatively connecting said center leaf to said frame, whereby said center leaf is rotatable through a selected arc about a pivot point on said linkage means between said down position at a first portion of said arc and said up position at a second portion of said arc; and

spring means for biasing said center leaf for pivotable movement about the selected arc to said up position;

said spring means providing a rotational moment towards said second arc portion less than an opposite rotational moment generated by the center leaf when said center leaf is in the first arc portion and a rotational movement greater than an opposite rotational movement generated by the center leaf when said center leaf is in the second portion of said arc;

wherein said center leaf is maintained in said down position by the difference between the moments generated by the spring means and the center leaf in the first portion of said arc and is maintained in said up position by the difference between the moments generated by the spring means and the center leaf in the second portion of said arc, wherein said spring means includes at least one torsion bar mounted between said frame and said center leaf;

said torsion bar including a first arm portion operatively connected to said frame and extending along said linkage means and an elongated second arm portion operatively connected to said center leaf and extending from said first arm portion at generally right angles thereto;

said first arm portion providing a levering force for lifting said center leaf and said second arm portion providing a rotational moment for lifting said center leaf;

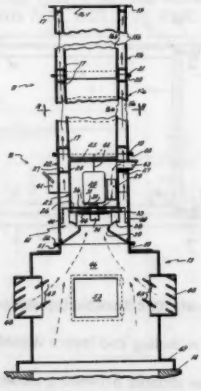
whereby said at least one torsion bar raises said center leaf to the up position when said end leaves are in the open position.

4,344,370

APPARATUS FOR DISCHARGING EXHAUST GAS AT HIGH VELOCITY

W. Christen Smith, Terrace Park; Terry J. McGill, Cincinnati, and Herbert L. Spangler, Bethel, all of Ohio, assignors to Industrial Air, Inc., Amelia, Ohio

Filed Jul. 24, 1980, Ser. No. 172,015
Int. Cl.³ F23L *17/02*
U.S. Cl. 110—162 **10 Claims**



1. An apparatus for discharging exhaust gas at high velocity comprising:

a cylindrical stack, said stack including,

(a) an outer wall and

(b) a coaxial inner wall forming an annular, substantially cylindrical passage for gasses,

one of said outer and inner walls being a substantially cylindrical wall and the other of said outer and inner walls being tapered toward said cylindrical wall from the bottom to the top of said stack so that said stack has a tapered annular cross-section,

said cylindrical passage at its upper end being free from obstruction to the high velocity vertical discharge of exhaust gasses,

an in-line fan for impelling exhaust gas admitted to the inlet of said fan to the outlet of said fan, the outlet of said fan being in communication with the bottom of said cylindrical passage,

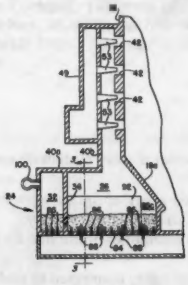
whereby said stack achieves a relatively high discharge velocity for exhaust so that the effective height of said stack is equivalent to that of a considerably taller cylindrical chimney.

4,344,371

VAPOR GENERATING SYSTEM HAVING INTEGRALLY FORMED GASIFIERS EXTENDING TO EITHER SIDE OF THE HOPPER PORTION OF THE GENERATOR

Robert J. Zoschak, Rutherford, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Mar. 31, 1981, Ser. No. 249,567
Int. Cl.³ C10K *3/00*; F22B *1/00*
U.S. Cl. 110—229 **11 Claims**



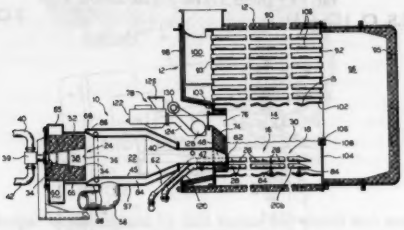
1. An integral generator/gasifier system comprising a vapor generator including a furnace section formed by four upright walls, the lower portion of two opposed walls being slanted inwardly to form a hopper portion, a plurality of openings formed in each of said opposed walls immediately above its slanted portion, at least two gasifiers extending adjacent said opposed wall portions, respectively, and surrounding the respective slanted wall portions and openings, so that the respective interiors of said gasifiers communicate with said openings, means for introducing fuel to each gasifier, means in each gasifier for supporting a bed of adsorbent material for the sulfur generated as a result of the gasification of said fuel, and means for passing air through said bed of adsorbent material to fluidize said material so that, upon gasification of said fuel, a substantially sulfur-free product gas is produced which passes from said gasifier, through said openings and into said furnace section, such that combustion of the gas and unreacted carbon occurs.

4,344,372

FLUIDIZED BED COMBUSTION DEVICE

Robert A. Chronowski, Great Falls, Va., assignor to Aqua-Chem, Inc., Milwaukee, Wis.

Filed Jun. 30, 1980, Ser. No. 164,034
Int. Cl.³ F23G 5/00
U.S. Cl. 110—245 3 Claims



1. A fluidized bed combustion device, including means defining a container,

a unitary bed of fluidizable particulate material disposed within said container and defining a bed,

a plurality of elongate, tubular gas distributing members arranged in a row and disposed within said container, at least a portion of said particulate material being disposed above said row of tubular members,

the tubular members which define the central portion of said row comprising a first gas distributing means and the tubular members at the lateral sides of said row comprising respectively second and third gas distributing means,

said second and third gas distributing means being disposed between said first gas distributing means and said container,

said tubular gas distributing members each having a plurality of spaced apart perforations formed therein for distributing fluidizing gases along their length and into plural zones within said bed,

first gas delivery means coupled to said first gas distributing means for delivering fluidizing gas to said first gas distributing means and air delivery means coupled to said second and third gas distributing means for delivering fluidizing air thereto in a path separate from said first gas delivery means,

control means coupled to said first gas delivery means and to said air delivery means and having a first mode to effect delivery of fluidizing gas to said first gas delivery means and for preventing the flow of fluidizing air to said second and third gas delivery means whereby the central portion of the bed will be fluidized while the side portions between said central portion and said container will remain quiescent, said control means also having a second mode for effecting the simultaneous delivery of fluidizing gas to the first gas delivery means and air to said second and third gas delivery means to simultaneously fluidize the entire bed,

said combustion device further including a start-up burner and a combustion chamber having a first end and an opposite end, said start-up burner being disposed at the first end of said combustion chamber and said first gas delivery means being coupled to the opposite end of said combustion chamber whereby heated combustion products are delivered therefrom to said first gas distributing means, and,

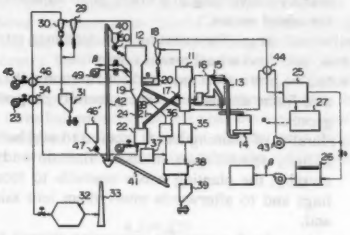
said air delivery means including a fan and a jacket surrounding said combustion chamber and having openings formed therein, the inlet of said fan being connected to said jacket for drawing air through said openings and into the space between said jacket and said combustion chamber and then into the inlet of said fan.

4,344,373

METHOD FOR PYROLYZING

Yoshiaki Ishii; Tsutomu Kume; Naoyoshi Ando, and Shosaku Fujinami, all of Yokohama, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Oct. 22, 1980, Ser. No. 199,543
Claims priority, application Japan, Oct. 30, 1979, 54/139271; Oct. 30, 1979, 54/139272
Int. Cl.³ F23D 1/00
U.S. Cl. 110—347 12 Claims



1. A method for effecting a pyrolyzing operation, said method comprising:

providing a two-bed pyrolysis system including a pyrolysis reacctor, a combustion reactor, and sand as a fluidized medium in said system;

introducing material to be pyrolized into said pyrolysis reactor and therein pyrolyzing said material while removing heat from sand herein, thus forming pyrolysis gas and char;

transferring cooled sand and said char from said pyrolysis reactor to said combustion reactor;

providing a sand lifting conduit between lower and upper portions of said combustion reactor;

providing a nozzle at the lower end of said sand lifting conduit and injecting pressurized gas through said nozzle and through said sand lifting conduit, thereby to lift sand to said upper portion of said combustion reactor;

combusting said char in said combustion reactor and thereby heating sand therein;

transferring heated sand from said combustion reactor to said pyrolysis reactor;

providing an annular ring having therein an annular air gap to surround said nozzle, and supplying air through said gap to increase the amount of said sand lifted through said sand lifting conduit;

determining a stable range of operation of said system with respect to physical factors thereof comprising the amount of sand in said system, the circulation rate of said sand, the pressure difference between the free boards of said reactors, and the superficial velocity in said pyrolysis reactor;

determining actual values of said physical factors; and

comprehensively regulating said physical factors using said actual values as parameters to effect operation of said system within said stable range, said regulating including controlling said circulation rate of said sand by regulating the amount of said pressurized air injected through said nozzle and the amount of said air supplied through said air gap.

4,344,374

HEAVY DUTY SEEDLING PLANTER

Joseph A. Gangluff, Rte. 1, Hattieville, Ark. 72063, and Wayne F. Charton, Rte. 2, Box 182 A, Morrilton, Ark. 72110

Filed Feb. 2, 1981, Ser. No. 231,046
Int. Cl.³ A01C 11/02
U.S. Cl. 111—2 6 Claims

1. A heavy duty seedling planting device comprising:

elongated, rigid frame means comprising a pair of elongated,

parallel channel members; said frame means having a front and a rear;

furrow cutting means secured to said frame means for opening a furrow in which seedlings are to be planted, said furrow cutting means comprising:

coulter wheel means rotatably secured between said frame channel members for cutting a furrow; and,

plow means secured to said frame means and depending downwardly therefrom for widening said furrow, said plow means comprising rigid, spaced-apart plates forwardly converging in a lower point adjacent said coulter wheel means;

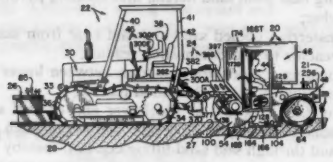
feed wheel means for inserting said seedlings into said furrow, said feed wheel means comprising:

rotatable hub means mounted for rotation with respect to said frame means in a plane generally perpendicular to ground;

a plurality of planting hands secured to said hub means at radially spaced-apart intervals thereon and revolved thereby; the planting hands operable to receive seedlings and to afterwards insert them into said furrow; and,

one way clutch means for preventing reverse rotation of said hub means while facilitating limited slip in response to overload;

compression pathway means for temporarily closing said planting hands after they receive a seedling to be planted



whereby to retain said seedling within said hand until the seedling is appropriately positioned for insertion into said furrow and for subsequently releasing said hand to effectuate seedling release;

chain means coupled between said feed wheel means and said coulter wheel means for rotating said planting hands between seedling receptive and seedling inserting positions; and,

compaction means for repacking said furrow after insertion of a seedling, said compaction means comprising:

a pair of elongated, rigid mounting bars disposed on opposite sides of said frame means, said mounting bars pivotally coupled to said frame means at the rear end thereof for rotation in a plane generally perpendicular to the ground and parallel to said coulter means;

a rotatable, rigid, metallic compacting wheel mounted on each of said mounting bars by inclination means pivotally secured to said mounting bars, said inclination means permitting user selectable variance in the inclination of each compacting wheel;

elongated, rigid rod means extending between said mounting bars for synchronizing same, said rod means extending through said frame means within an arcuate travel limiting slot provided therein; and,

hydraulic ram means coupled to said last mentioned rod means for pivoting said mounting bars to engage or disengage the compaction wheels.

4,344,375

SEWING MACHINE WITH A LOOPER ARRANGED ABOVE THE POINT OF STITCH FORMATION

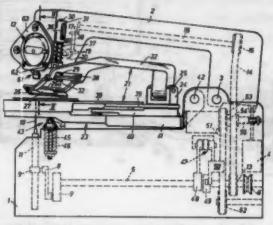
Günter Tölle, Bruchsal, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Oct. 31, 1977, Ser. No. 846,989

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1976, 2650352

Int. Cl.³ D05B *57/14, 57/26, 29/06, 3/06*

U.S. Cl. 112—131 **2 Claims**



1. A sewing machine for sewing workpieces with a needle which reciprocates in a needle operational plane and penetrates the workpieces in an area of stitch formation, comprising a stationary bottom part, an arm having one end pivotally mounted on said bottom part and an opposite arm end overlying said bottom part, said arm being movable from a fixable sewing position to an inoperative position away from the area of stitch formation, a revolving looper having an axis about which it is rotatable and being rotatably mounted on said opposite arm end and having a thread exit opening, said needle being mounted for upward and downward movement on said bottom part for cooperation with said looper, means on said bottom part for clamping a workpiece between said needle and said looper at the area of stitch formation, said needle traversing the workpiece upwardly to effect the stitch formation, a looper thread guide member mounted on said opposite arm end adjacent said looper having a thread deflector located between the needle and said thread exit opening of said looper and extending above the area of stitch formation directly laterally of the needle operational plane and crosswise to said axis of said looper, said deflector including a downwardly extending work hold-down member directed downwardly from the thread deflector and wherein said means for clamping a workpiece comprises a lower clamping part overlying said bottom part and an upper clamp part pivoted to said bottom part and having a front arm portion with a tensioning frame forming an opening through which the needle passes, said hold-down member protruding through said tensioning frame to directly above said tensioning frame on the work.

4,344,376

MECHANISM GENERATING ELLIPTICAL MOTION

Chandrakant Bhatia, Buffalo Grove; George M. Toman, Chicago, and Thomas J. Bock, Schaumburg, all of Ill., assignors to Union Special Corp, Chicago, Ill.

Filed May 9, 1978, Ser. No. 904,204

Int. Cl.³ D05B *57/36*

U.S. Cl. 112—200 **4 Claims**

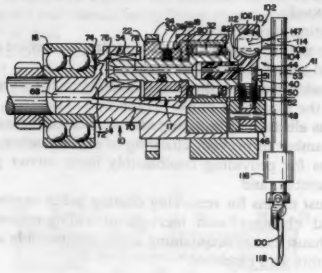
1. A sewing machine assembly including at l[illegible]t one stitch forming means comprising:

drive means including a Cardan gear means having a main bearing means subjected to a generally constant load vector, an output centerpoint means and a double speed bearing means carrying an output means;

a looper bar means;

means operative having an output center point means the same as that of said Cardan gear means to convert elliptical two dimensional motion into elliptical like three di-

mensional motion connecting said output means to said looper bar means; and



a looper means carried by said looper bar means and activated by said driving means.

4,344,377

SAIL CRAFT

Knud F. Gram, Tibberup Alle 28, Espergaerde 3060, Denmark

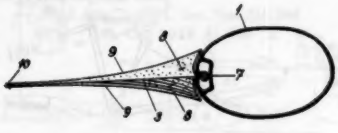
PCT No. PCT/DK79/00014, § 371 Date Jan. 16, 1980, § 102(e) Date Jan. 11, 1980, PCT Pub. No. WO79/01077, PCT Pub. Date Dec. 13, 1979

PCT Filed May 14, 1979, Ser. No. 190,868

Claims priority, application Denmark, May 16, 1978, 2134/78

Int. Cl.³ B63H *9/04*; B63B *15/00*

U.S. Cl. 114—103 **5 Claims**



1. A sail craft having a mast and a thin flat sail attached thereto, a buoyancy body fastened to as least the upper portion of said sail, the buoyancy body being made of flexible foam material attached to both sides of the sail with the foam material being flush with the mast but having no connection with the mast, the foam material being shaped such as to form together with the sail and the mast an air foil profile having a smooth uninterrupted surface, with the foam material tapering from the mast towards the aft end of the sail.

4,344,378

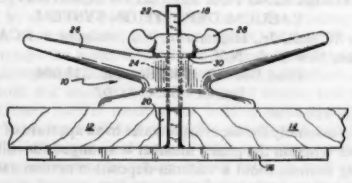
PORTABLE CLEAT FOR MARINE USE

Edson J. Martin, Box 309, Canton, N.Y. 13617

Filed Apr. 28, 1980, Ser. No. 144,420

Int. Cl.³ B63B *21/04*

U.S. Cl. 114—218 **2 Claims**



1. A portable cleat assembly for boat mooring lines, the cleat assembly being adapted to be temporarily mounted on a dock or pier comprised of a plurality of spaced apart planks, the cleat assembly comprising in combination an elongated, relatively narrow bottom plate adapted to be passed downwardly between a pair of adjacent planks for engagement with the underside of the planks, the plate when so engaged being transversely disposed with respect to the length of the planks, a rod member rigidly secured at one end to the approximate mid-point of the bottom plate so as to project upwardly therefrom in substantially perpendicular relation thereto, the rod member having a square cross section with at least the upper portion thereof being threaded, the rod member being arranged to extend upwardly between adjacent planks and project above the upper sides thereof, a cleat element engageable with the upper side of the dock planking, the cleat element having a central bore for receiving the rod member, the cleat element bore having a cross section conforming to that of the rod member to prevent relative rotation therebetween, and a wing nut threaded onto the rod member above the cleat element and adapted to force the cleat element into clamping engagement with the dock planking when the nut is tightened down.

4,344,379

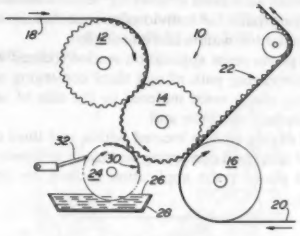
BONDING MACHINE AND GRAVURE APPLICATOR ROLL

Webster C. Roberts, Cherry Hill, N.J., assignor to Molins Machine Company, Inc., Cherry Hill, N.J.

Filed Feb. 2, 1981, Ser. No. 230,770

Int. Cl.³ B05C *1/08*

U.S. Cl. 118—44 **12 Claims**



1. A system for applying a selectively variable amount of liquid bonding agent to the crests of a web of corrugated paperboard comprising a frame, a vessel associated with the frame for holding a supply of liquid bonding agent, an applicator roll associated with the vessel for transferring a bonding agent from the vessel to crests of a corrugated medium, the surface of the applicator roll being provided with successive patterns of different size cells, each pattern of cells comprising axially extending rows of cells of different volume, all cells in a row being of substantially equal volume, and means for rotating said applicator roll so as to change the phase of the cells relative to the crests of the corrugated paper to vary the amount of bonding agent transferred to the crests from said cells.

4,344,380

APPARATUS FOR APPLYING PHOTO RESIST ON BOTH SURFACES OF SEMICONDUCTOR WAFER

Ritsuo Matsumiya, and Mitsuaki Osawa, both of Omiya, Japan, assignors to M. Setek Company Limited, Tokyo, Japan

Filed Dec. 17, 1980, Ser. No. 217,544

Claims priority, application Japan, Dec. 18, 1979, 54-163926

Int. Cl.³ B05C *13/02*

U.S. Cl. 118—66 **6 Claims**

1. Apparatus for applying photo resist on two opposite surfaces of a semiconductor wafer comprising:

a first conveying section defining a first conveying path for

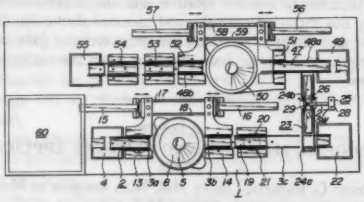
individually successively conveying semiconductor wafers into said apparatus;

a first photo resist application section located within said first conveying path of said first conveying section for applying photo resist material to one side of said wafers;

a first drying section located within said first conveying path of said first conveying section in sequence after said first photo resist application section for drying said wafers;

a second conveying section arranged in operative association with said first conveying section for receiving wafers therefrom, said second conveying section defining a second conveying path for individually successively conveying semiconductor wafers therethrough;

a reversing section provided within said second conveying



path of said second conveying section for turning said wafers upside down;

a third conveying section arranged in operative association with said second conveying section for receiving wafers therefrom, said third conveying section defining a third conveying path for individually successively conveying semiconductor wafers therethrough;

a second photo resist application section located within said third conveying path of said third conveying section for applying photo resist material to the side of said wafers opposite said one side; and

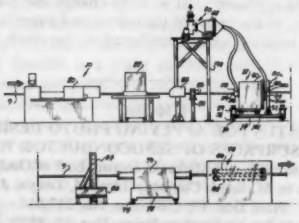
a second drying section located within said third conveying path of said third conveying section in sequence after said second photo resist application section for drying said wafers.

4,344,381

APPARATUS FOR CONTINUOUSLY ELECTROSTATICALLY COATING AN ELONGATED OBJECT

Arthur E. Ostrowski, Valparaiso, Ind., and Joseph M. Polich, Chicago, Ill., assignors to Allied Tube & Conduit Corporation, Harvey, Ill.

Filed Dec. 29, 1980, Ser. No. 220,710
Int. Cl.³ B05B 5/02
U.S. Cl. 118—626 **13 Claims**



1. Apparatus for electrostatically coating, with liquid coatings including organic solvent-based coatings, an electrically grounded, elongated object of indefinite length moving along a straight-line path, said apparatus comprising;

a substantially closed chamber having an inlet port through which the elongated object enters said chamber, an outlet port through which the elongated object exits said chamber, and means electrically insulating said chamber from ground;

a coating supply system;

electrostatic coating applicator means to atomize and charge said supplied coating material;

mounting means to direct said applicator means at a portion of the elongated object within said chamber;

means electrically isolating said applicator means from said chamber to prevent charging of said chamber;

means for providing combustibly inert carrier gas to said chamber; and

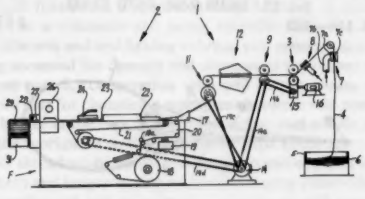
exhaust means for removing coating-laden carrier gas from said chamber, said inert-gas-providing-means and said exhaust means maintaining a non-combustible atmosphere within said chamber.

4,344,382

APPARATUS FOR APPLYING ATOMIZED PLASTICIZER TO A RUNNING TOW OF FILAMENTARY FILTER MATERIAL

Nikolaus Haüsler, Oststeinbek, and Adolf Helms, Hamburg, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Apr. 15, 1981, Ser. No. 254,521
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1980, 3014807
Int. Cl.³ B05B 13/02
U.S. Cl. 118—674 **14 Claims**



1. Apparatus for applying liquid plasticizer to a running tow of filamentary filter material, particularly in a filter rod making machine, comprising a source of liquid plasticizer; means for transporting the tow of filamentary material along a predetermined path having a predetermined width; an ultrasonic atomizing device adjacent to said path and operable to spray atomized plasticizer onto successive increments of the tow in said path, comprising a flexural resonator having a substantially rectangular atomizing surface extending substantially along the full width of said path, piezoceramic means connected with said resonator and a source of a-c potential connected with said piezoceramic means to effect expansion and contraction of said piezoceramic means and corresponding movements of said flexural resonator; and means for supplying plasticizer from said source to said atomizing device, including means for delivering liquid plasticizer to said atomizing device.

4,344,383

RETAINER RING FOR SECURING SUBSTRATES IN A VACUUM DEPOSITION SYSTEM

Walter W. Salt, Jr., Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 10, 1980, Ser. No. 215,004
Int. Cl.³ B05C 13/02
U.S. Cl. 118—730 **1 Claim**

1. An assembly for securing a wafer in an aperture of a planet member wherein the planet member is arranged for rolling and orbiting motion about a vacuum deposition system axis, comprising:

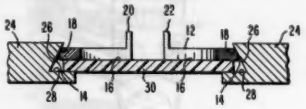
a circular bearing wall;

a support surface affixed to one end of the bearing wall for

supporting the wafer, the bearing wall and support surface mounted in the planet member to define an outwardly tapered aperture therein, the diameter of the bearing wall at the one end thereof being larger than the diameter at the opposite end;

a substantially flat, resilient member arranged as an open-ended annulus, the annulus having an outer side wall of a given diameter greater than the diameter of the bearing wall at the one end thereof;

a beveled surface between the top surface and the outer side wall of the annulus; and



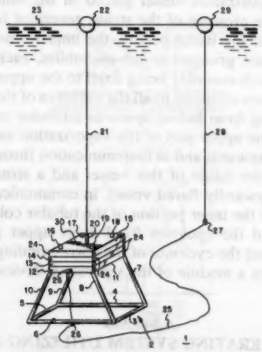
engaging means affixed to each end of the annulus for engaging and applying compressive forces to the annulus and for inserting the annulus into the aperture, whereby when the annulus is inserted in the aperture and the compressive forces released, the annulus expands to position the beveled surface thereof in parallel coplementary mating engagement with the bearing wall of the aperture and the annulus is forced in a direction toward the support surface.

4,344,384

SEA LIFE HABITAT

Paul R. Rowley, Goleta, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 2, 1981, Ser. No. 250,344
Int. Cl.³ A01K *61/00*
U.S. Cl. 119—4 **3 Claims**



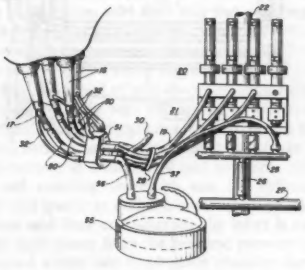
1. Apparatus for growing sea life in an enclosed habitat module in the sea comprising a base means adapted to rest on the sea floor, said base means carrying a support means for receiving and supporting at least one module, guide means carried by said base and/or support means for guiding said at least one module to said support means as said module is lowered through the water toward said support means, said guide means comprising a plurality of upstanding members spaced apart from one another over said support means, and at least one enclosed habitat module for holding said sea life, said module carrying receiving means for mating with and following said guide means, said module receiving means comprising a plurality of apertures which extend through said modules from top to bottom, said apertures being sized so that a guide member will pass therethrough, said apertures being spaced apart across said module so as to correspond with the spacing of said guide members so that said receiving means will mate with said guide members as said module is lowered toward said support means, said guide means being of a height so that their top ends just protrude from the top surface of the upper module carried by said support means, said module also carrying conduit connection means for communicating with the interior of said module for feeding purposes, and conduit means operably connected to said connection means, said conduit means being of a length adequate at least to reach the surface of the water.

4,344,385

MILKER

Harold V. Swanson, Downers Grove, and Duncan M. Thompson, Warrenville, both of Ill., assignors to Babson Bros. Co., Oak Brook, Ill.

Continuation-in-part of Ser. No. 902,331, May 3, 1978, abandoned. This application Aug. 15, 1979, Ser. No. 66,866
Int. Cl.³ A01J *5/04, 7/00*
U.S. Cl. 119—14.08 **11 Claims**



1. An independent quarter milker for use in the stall of a milking parlor, the stall confining a cow during milking, and having an evacuated milk pipeline adjacent thereto comprising:

four double action teat cups, one for connection with each of the cow's teats;

four milk conduit means including a flexible hose, one connected with each teat cup to direct the milk to said milk pipeline, the milk from each quarter being isolated from the milk from the other quarters;

means measuring the electrical current flow through the milk in each conduit means for sensing flow through each conduit;

an electrically actuated shutoff valve in each conduit means; and

means responsive to said flow sensing means for closing each shutoff valve in the absence of milk flow through the associated conduit means, said shutoff valves, flow sensing means and valve closing means being mounted on the stall structure adjacent the cow.

4,344,386

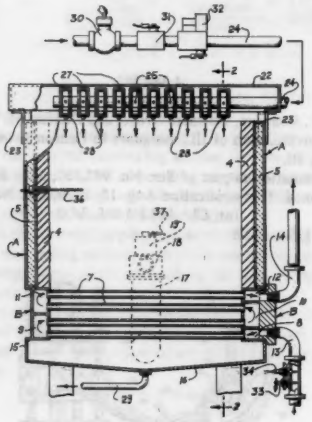
HEAT TRANSFER EQUIPMENT AND METHOD

Robert B. Black, 2925 Denver St., Corpus Christi, Tex. 78404

Continuation-in-part of Ser. No. 46,240, Jun. 7, 1979, Pat. No. 4,271,789, and a continuation-in-part of Ser. No. 58,779, Jul. 19, 1979, abandoned, said Ser. No. 46,240, is a continuation-in-part of Ser. No. 813,667, Jul. 7, 1977, Pat. No. 4,197,831, which is a continuation of Ser. No. 620,327, Oct. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 462,094, Apr. 18, 1974, Pat. No. 4,025,291, which is a division of Ser. No. 192,262, Oct. 26, 1971, Pat. No. 3,844,270, said Ser. No. 58,779, is a continuation-in-part of Ser. No. 794,044, May 5, 1977, abandoned, which is a division of Ser. No. 568,699, Apr. 16, 1975, abandoned, which is a division of Ser. No. 369,084, Jun. 11, 1973, abandoned. This application Sep. 5, 1980, Ser. No. 184,655

Int. Cl.³ F22B *5/02*

U.S. Cl. 122—19 10 Claims



1. Heat transfer equipment comprising a combustion chamber, means for introducing a mixture of gaseous fuel and air into an upper region of the combustion chamber, a group of spaced externally finned tubes in a lower region of the combustion chamber and being upwardly exposed to the combustion chamber substantially throughout the length of the tubes, and the tubes having header means providing for flow of a fluid to be heated through the tubes, an exhaust manifold below the tubes for receiving gaseous products of combustion delivered downwardly between the tubes substantially throughout the length of the tubes of said group, and the exhaust manifold having a discharge opening for delivery of gaseous products of combustion, and a blower for establishing a flow of the mixture of fuel and air in a path extended downwardly through the combustion chamber and in a direction downwardly between the tubes substantially throughout the length thereof, the blower providing for delivery of products of combustion downwardly through the spaces between the tubes and into the manifold, the tubes being extended transversely of the path of flow of the products of combustion with the tube fins lying in planes generally paralleling said path of flow substantially throughout the length of the tubes.

4,344,387

DEVICE FOR SEPARATING WATER FROM STEAM AT THE VAPORIZATION VESSEL OUTLET OF A STEAM GENERATOR

Jean-Claude Yazidjian, Bougival, France, assignor to Framatome, Courbevoie, France

Filed Apr. 8, 1981, Ser. No. 251,850

Claims priority, application France, Apr. 18, 1980, 80 08734

Int. Cl.³ F22B *1/02*

U.S. Cl. 122—34 10 Claims

1. In a device for separating water from steam at the vaporization vessel outlet of a recycling steam generator, such as a steam generator used in a nuclear power station, constituted by a set of vertical cylindrical tubes within which deflector elements are arranged, called cyclones, giving the steam a helical path enabling separation of the water by centrifugal force when the steam, charged with water before emerging from the upper part of the generator, traverses these tubes arranged above the vaporization vessel placed in the outer envelope resistant to the pressure of the steam generator in which the vaporization of the water occurs, the improvement whereby the cyclones are grouped in sub-assemblies, each of the cyclones of one sub-assembly being fixed to the upper part of the support structure common to all the cyclones of the sub-assembly, comprising from below upwards a tubular column fixed vertically to the upper part of the vaporization vessel extending the latter upwards and in communication through its inner portion with the inside of this vessel and a structure in the shape of an upwardly flared vessel, in communication on the one hand with the inner portion of the tubular column and on the other hand the cyclones fixed at its upper portion, the flared vessel and the cyclones of the corresponding sub-assembly constituting a module of the separating device.

4,344,388

VAPOR GENERATING SYSTEM UTILIZING INTEGRAL SEPARATORS AND ANGULARLY ARRANGED FURNACE BOUNDARY WALL FLUID FLOW TUBES HAVING RIFLED BORES

William D. Stevens, North Caldwell, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

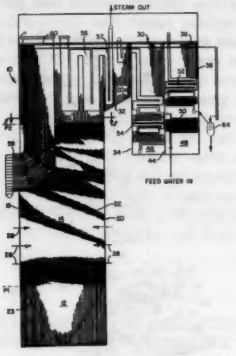
Continuation of Ser. No. 849,273, Nov. 7, 1977, Pat. No. 4,191,133. This application Dec. 28, 1979, Ser. No. 108,054

Int. Cl.³ F22B *21/34*

U.S. Cl. 122—235 R 37 Claims

1. A vapor generating system comprising an upright furnace section the boundary walls of which are formed by a plurality of tubes having fins extending outwardly from diametrically opposed portions thereof, with the fins of adjacent tubes being welded together to form a gas-tight structure, burner means associated with said furnace section, said tubes extending vertically in the plane of each boundary wall in the upper portion of said furnace section walls and extending at an acute angle with

respect to a horizontal plane in at least a portion of said boundary walls extending below said upper portion, means for simultaneously passing water through the tubes of all said boundary



walls to add heat from said burner means to said water to convert said water to steam, and a rifled bore formed in said acute-angularly extending tubes.

4,344,389

FUEL/AIR MIXING DEVICE

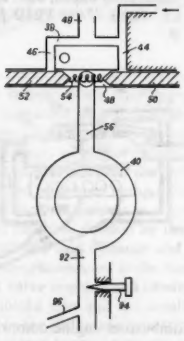
Anizio G. R. Nunes, Johannesburg, South Africa, assignor to Automotive Invention Researchers (Pty) Limited, Johannesburg, South Africa

Filed Mar. 10, 1980, Ser. No. 128,898

Claims priority, application South Africa, Jan. 21, 1980, 80/0328

Int. Cl.³ F02D *19/00*

U.S. Cl. 123—25 B **13 Claims**



1. A fuel/air mixing device comprising:

a body;

an air passage passing through the body and being adapted to be connected to supply a fuel/air mixture to the inlet manifold of an internal combustion engine;

chamber means in which gasoline and water can be mixed;

separate fuel and water lines to the chamber means;

liquid inlet nozzle means adjacent the periphery of said air passage through which the fuel/liquid mixture from said chamber means may be supplied to said air passage when in use;

first valve means for controlling the passage of the fuel/air mixture from said air passage to the inlet manifold of an internal combustion engine; and

second valve means for controlling the fuel supply to said air passage via said chamber means, which defines two apertures through which fuel can pass, such passage of fuel being controlled respectively by needle valves, the opening and closing of one said needle valve being determined by the vacuum created in said air passage and the other needle valve being controlled by the position of said first valve means.

4,344,390

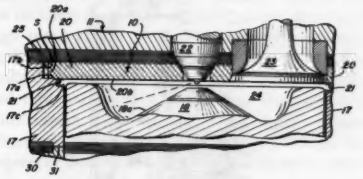
PISTON-CYLINDER ASSEMBLY OF AN INTERNAL COMBUSTION ENGINE

Hans Heydrich, Phoenix, Ariz.; Melvin E. Woods, Columbus, Ind., and William C. Geary, Balston Lake, N.Y., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 31, 1979, Ser. No. 108,833

Int. Cl.³ F02B *75/08*

U.S. Cl. 123—41.82 A **14 Claims**



1. A piston-cylinder assembly of an internal combustion engine comprising an engine block having a bore formed therein; a cylinder liner having an inner diameter mounted within said bore; a cylindrical spacer having one end disposed in closely spaced relation to an end of said liner, said spacer having a cylinder-forming surface comprising an inner bore extending therethrough and having an inner diameter substantially equal to the inner diameter of said liner, said spacer extending axially from said liner end and coacting with said liner to form together an elongated cylinder; a piston mounted for reciprocatory movement within the elongated cylinder; an end piece overlying and being supported by a recessed shoulder within a second end of said spacer opposite said liner end, said end piece coacting with said spacer to substantially close one end of the elongated cylinder, so as to create a top cylinder-forming surface, said piston when at one stroke limit being in close proximity to a surface of said end piece adjacent said cylinder and coacting therewith and the cylinder-forming surface of said spacer to define a combustion chamber axially spaced from said liner end whereby the latter is substantially shielded by said spacer from the heat and pressure of combustion generated within said combustion chamber during operation of the engine; first means spaced from said combustion chamber for securing said end piece in assembled relation with said spacer; and thermal insulating second means coacting with said end piece, said first means, said spacer ends and said liner end to substantially impede the transfer of the heat of combustion from said combustion chamber to said block, liner and first means during operation of the engine.

4,344,391

IGNITION TIMING CONTROL MEANS FOR INTERNAL COMBUSTION ENGINES

Masashi Mizutani, and Shiro Nakamura, both of Hamamatsu, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

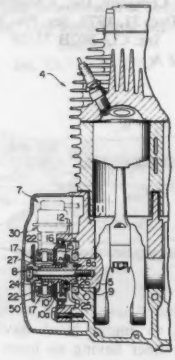
Division of Ser. No. 915,237, Jun. 13, 1978, abandoned. This application Jan. 7, 1980, Ser. No. 109,988

Int. Cl.³ F02P *5/10, 5/06;* **B62M** *7/04;* **F01C** *1/30*

U.S. Cl. 123—146.5 A **10 Claims**

1. In a motor cycle including front and rear wheels, a frame carried by the wheels, and a multi-cylinder internal combustion engine having a body portion and a crankshaft disposed transversely of the frame; ignition timing control means for

controlling ignition timing, and comprising a base adapted to be mounted on the body portion of the engine, a control disc rotatably mounted on said base, driving shaft means provided at one end of the crankshaft of the engine for being driven thereby and arranged coaxially with respect to the control disc, ignition signal generating means provided on the control disc for generating an ignition signal, further means provided on said driving shaft means for making the generating means produce an ignition signal at a predetermined angular phase of the driving shaft means, intake pressure responsive means mounted on the base and responsive to intake pressure for determining positioning of the control disc, and connecting



means between the intake pressure responsive means and the control disc for rotating the control disc by an angular extent corresponding to engine intake pressure so as to change the angular phase of the driving shaft means at which the ignition signal is generated;

the improvement wherein said intake pressure responsive means is disposed above said driving shaft means and at a position rearwardly offset from said driving shaft means, whereby interference between the ground and the intake pressure responsive means is avoided and interconnection of the intake pressure responsive means is provided efficiently and with a minimum amount of material.

4,344,392

SPARK-IGNITION INTERNAL COMBUSTION ENGINE

Tamotsu Iijima, and Yasuo Takagi, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jan. 10, 1980, Ser. No. 111,074

Claims priority, application Japan, Jan. 18, 1979, 54-5458890[U]

Int. Cl.³ F02N *11/08*

U.S. Cl. 123—179 G **16 Claims**

1. A fuel supply system for a spark-ignition internal combustion engine comprising:

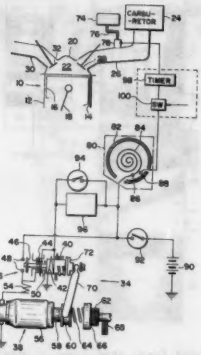
a primary mixture supply system including a primary fuel delivery circuit;

an electrically-operated cranking device operative to crank the engine to start when actuated;

an auxiliary mixture supply system including an auxiliary fuel delivery circuit which has one end opening into said primary mixture supply system;

an electrically operated valve provided in said auxiliary fuel delivery circuit for controlling delivery rate of the auxiliary fuel through said auxiliary fuel delivery circuit; and

an electric control circuit responsive to at least one preselected operational parameter of the engine during starting for actuating said valve and thereafter, following a predetermined time delay, actuating said cranking device to start the engine, said control circuit including a starter switch electrically connected between said cranking device and a power source, a main control switch electrically connected between said valve and said power source across said starter switch and responsive to said preselected parameter, a delay circuit electrically connected



between said cranking device and said power source across said starter switch, and an auxiliary control switch connected in shunt across said delay circuit and operative conversely to said main control switch in response to said preselected operational parameter.

4,344,393

INTERNAL COMBUSTION ENGINE

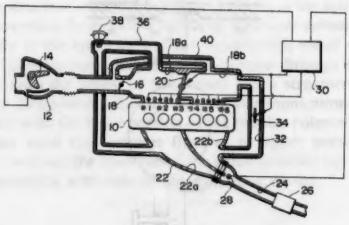
Yukihiro Etoh, Yokohama; Toshiaki Tanaka, Fujisawa; Fukashi Sugasawa, Yokohama, and Haruhiko Iizuka, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 20, 1980, Ser. No. 161,369

Claims priority, application Japan, Jun. 22, 1979, 54-78699

Int. Cl.³ F02B *77/00;* F02D *17/02*

U.S. Cl. 123—198 F **5 Claims**



1. An internal combustion engine comprising:

(a) first and second cylinder units each including at least one cylinder;

(b) an intake passage provided therein with a throttle valve and divided downstream of said throttle valve into first and second branches leading to said first and second cylinder units, respectively;

(c) a stop valve provided at or near an entrance of said intake passage second branch;

(d) an exhaust passage leading from said first and second cylinder unit;

(e) an air/fuel ratio sensor located in said exhaust passage for providing a signal indicative of the air/fuel ratio sensed from the engine exhaust;

(f) a three-way catalytic converter located in said exhaust passage downstream of said air/fuel ratio sensor;

(g) an EGR passage connecting said exhaust passage to said

intake passage second branch downstream of said stop valve;

(h) an EGR valve provided in said EGR passage;

(i) control means, responsive to low engine load conditions, for disabling said second cylinder unit, closing said stop valve to disconnect said intake passage second branch from said intake passage, and opening said EGR valve to permit recirculation of exhaust gases into said second cylinder unit, said control means also being responsive to said air/fuel ratio sensor, for maintaining the air/fuel ratio at which said engine is operating at a desired value; and

(j) a bypass passage opening at its one end into said intake passage upstream of said throttle valve and at the other end into said intake passage second branch downstream of said stop valve for introducing air into said intake passage second branch and mixing air with exhaust gases recirculated into said intake passage second branch at low engine load conditions.

4,344,394

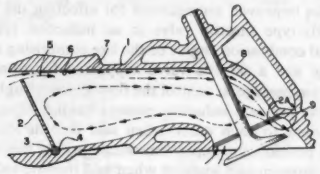
HIGH SWIRL VERY LOW POLLUTION PISTON ENGINE EMPLOYING OPTIMIZABLE VORTICITY

Merle R. Showalter, Madison, Wis., assignor to Automotive Engine Associates, Madison, Wis.

Continuation-in-part of Ser. No. 914,857, Jun. 12, 1978, abandoned, which is a continuation of Ser. No. 791,422, Apr. 27, 1977, abandoned, which is a continuation of Ser. No. 547,040, Feb. 4, 1975, abandoned. This application Jun. 11, 1979, Ser. No. 47,472

Int. Cl.³ F02B *31/00*

U.S. Cl. 123—306 **12 Claims**



1. A piston type homogeneous charge engine for achieving stable and rapid dilute combustion to produce very low NO_x output, wherein the engine includes an engine head, an air throttle, fuel input means, an intake volume in an intake manifold fluidly connected between said air throttle and an intake port in the engine head, said head being mounted on a cylinder block including a cylindrical passage in which a piston reciprocates, a combustion chamber defined by the geometrical combination of said head and said cylinder and said piston,

said intake port being connected to the combustion chamber,

an intake poppet valve opening and closing fluid connection between said intake port and the combustion chamber in phase relation to the piston reciprocations to control flow from the intake port to the combustion chamber,

exhaust valve means fluidly connecting the combustion chamber to an exhaust passage and opening and closing in specific phase relation to piston reciprocation,

ignition means inside the combustion chamber firing in phase to piston reciprocation,

said engine operating on the four cycle principle comprising an intake stroke, a compression stroke, a power stroke and an exhaust stroke;

a variable restriction element to variably restrict flow in the intake port to produce a high velocity intake flow structured as "Coanda" flow in the intake port, said variable restriction element in the intake port being capable of a full opening position whereby said variable restriction element does not materially restrict the flow capacity of the intake poppet valve, and wherein in the closed position said element restricts the flow capacity of the intake port, poppet valve system to less than ¼ of the unrestricted flow volume for a given pressure drop,

the variable restriction element and that portion of the intake port between said variable restriction element and the intake poppet valve being shaped so that when said variable restriction element is in a restricted position the flow-pattern system downstream of the variable restriction element forms a flow pattern one, wherein the flow past said variable restriction element separates smoothly from said variable restriction element in a manner whereby said flow attaches to a wall of said intake port to form a "Coanda" wall attached flow and whereby the volume of said intake port between said variable restriction element and said poppet valve not occupied by said wall attached "Coanda" flow is filled with a fluid mechanically stable recirculating vortex system, where said vortex system smoothly interacts with said "Coanda" flow to minimize the turbulent dissipation of said "Coanda" flow, where the high speed stream of the "Coanda" flow passes by the intake poppet valve into the combustion chamber in a structured three dimensional flow, a flow pattern two, said flow pattern two having high angular momentum with respect to the center of the engine cylinder and where said flow passes predominantly over less than 180 degrees of the face of said intake poppet valve, where said flow pattern two is arranged so that in interaction with said combustion chamber surfaces flow pattern two induces and forms a three dimensional in-cylinder flow pattern, a flow pattern three, said in-cylinder flow pattern three having velocity gradients such that any fluid element located outside of combustion chamber boundary layers is by the end of the compression stroke stretched, distorted and spread within the combustion chamber volume so that said fluid element is widely distributed spatially over said combustion chamber volume prior to ignition time, so that the concentration gradients of fuel within the interior of said combustion chamber volume are substantially increased by said structured flow causing substantial increase in the speed and completeness of mixing for a set turbulence level within the combustion chamber volume to produce substantially homogenious air-fuel-residual microscale volume mixing statistics in the combustion chamber by ignition firing time,

wherein the variable restriction element is adjusted with sufficient flow restriction so that a sufficient flow kinetic energy is delivered from said port to said combustion chamber so that the in-cylinder three dimensional flow pattern, flows so that the interaction of the initial flow energy pattern with the combustion chamber walls and the turbulent flow energy decay rates leaves sufficient turbulence levels in the chamber at combustion time to produce a turbulent to laminar flame speed ratio high enough so that cycle efficiency losses due to long combustion durations do not outweigh the thermodynamic and pumping loss advantages of dilute combustion compared to combustion cycle efficiencies of a low residual fraction mixture with an equivalence ratio of 0.9 stoichiometric in said engine,

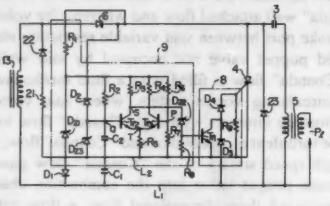
control means for the throttle opening, variable restriction element and fuel input means, so that for the rotation speed, intake manifold volume displacement, and inlet and outlet valve timing for said engine, the masses of fuel, air and products of combustion in the cylinder during the compression stroke form ratios and gross concentrations such that before ignition firing time, a lean combustible mixture is formed having sufficient dilution so as to inhibit NO formation.

4,344,395

IGNITION SYSTEM WITH IGNITION TIMING RETARDING CIRCUIT FOR INTERNAL COMBUSTION ENGINE

Tadashige Kondo; Susumu Ohno, both of Tokyo; Kenichi Takata, Mitaka, and Hisashi Inaga, Tokyo, all of Japan, assignors to Kioritz Corporation, Japan

Filed May 14, 1980, Ser. No. 149,884
Int. Cl.[3] F02D 5/04; F02P 1/00; F02D 11/10
U.S. Cl. 123—335 1 Claim



1. An ignition system with an ignition retard circuit for an internal combustion engine comprising:

a magneto coupled to a crank shaft of said engine;

an ignition coil having primary and secondary windings;

a charging capacitor charged from one half-cycle of a.c. voltage generated by said magneto;

an ignition control thyristor connected in parallel with a series circuit of said charging capacitor and the primary winding of said ignition coil, said ignition control thyrsitor being rendered conductive by receiving the opposite half-cycle of said a.c. voltage from said magneto as an ignition signal;

a switching transistor connected in parallel to a gate-cathode circuit of said ignition control thyristor, said switching transistor being adapted to become conductive upon receiving a switching signal and to bypass said ignition signal without applying to the gate of said ignition control thyristor;

a series circuit of a first resistor and a first Zener diode connected in parallel to the series circuit of said charging capacitor and the primary winding of said ignition coil, said first Zener diode maintaining a predetermined constant voltage thereacross during said charging capacitor being held charged;

a voltage divider circuit including a series of two resistors connected in parallel to said first Zener diode for establishing a reference voltage at a junction point of said two resistors;

a time constant circuit including a series of a resistor and a capacitor connected in parallel with said first Zener diode for developing a voltage at a junction point of said resistor and said capacitor increasing in accordance with a time constant of said time constant circuit;

a parallel circuit of first and second transistors connected in parallel with said first Zener diode, said first and second transistors having bases respectively connected to the junction point of said time constant circuit and the junction point of said voltage divider circuit, said first and second transistors having collectors connected to the cathode of said first Zener diode respectively via second and third resistors and having emitters connected to the cathode of said first Zener diode via a common resistor

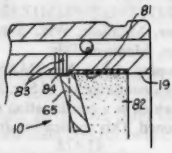
a junction point between the collector of said first transistor and said first resistor being connected to the base of said switching transistor via a second Zener diode, said second transistor being conductive during a period in which said reference voltage established in said voltage divider circuit is higher than said voltage developed in said time constant circuit, and said switching signal being supplied to said switching transistor through said junction point between the collector of said first transistor and said first resistor and through said second Zener diode, whereas said first transistor being rendered conductive when the voltage at the junction point of said time constant circuit is higher than said reference voltage thereby to cut off the supply of said switching signal to said switching transistor.

4,344,396

INDUCTION SYSTEM OF MULTI-CYLINDER ENGINE

Minoru Yamada, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Division of Ser. No. 965,485, Dec. 1, 1978, Pat. No. 4,243,000.
This application Apr. 18, 1980, Ser. No. 141,284
Int. Cl.[3] F02M 13/06
U.S. Cl. 123—337 4 Claims



1. An improved arrangement for effecting the sealing of a butterfly-type throttle valve in an induction system for an internal combustion engine or the like comprising an induction passage and a throttle valve supported for rotation in said induction passage to control the flow therethrough, said throttle valve and said induction passage having adjacent surfaces juxtaposed to each other when said throttle valve is in its closed position, the improvement comprising means providing a seal between said surfaces when said throttle valve is closed to effectively preclude any leakage past said throttle valve, said throttle valve being mounted upon a shaft, said shaft having a slot through which said throttle valve extends, the seal comprising a split resilient metal ring carried by said throttle valve, the gap provided by the slit ends of said ring being positioned within said shaft.

4,344,397

METHOD FOR OPERATION OF A SPARK-IGNITED INTERNAL COMBUSTION ENGINE AND ARRANGEMENT FOR EXECUTION OF THE METHOD

Istvan Geiger, Muhlenring, and Heinz Theuerkauf, AM Sundern, both of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

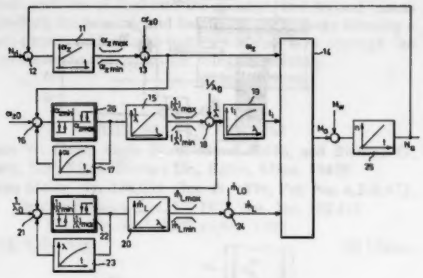
Filed May 2, 1980, Ser. No. 146,075
Claims priority, application Fed. Rep. of Germany, May 5, 1979, 2918135
Int. Cl.[3] F02P 5/04; F02D 11/10
U.S. Cl. 123—339 12 Claims

1. A method for operating a spark-ignited internal combustion engine to stabilize the actual idle speed to be approximately equal to a desired idle speed, said method comprising:

supplying said engine with a lean fuel-air mixture having a high air ratio, exceeding the air ratio corresponding to maximum mean indicated pressure;

controlling the ignition timing of said engine within a pair of

selected ignition timing limits to bring said actual idle speed toward said desired idle speed;



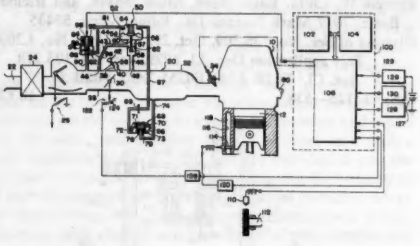
and initiating a controlling of said air ratio of said mixture only when said ignition timing attains one of said limits, to bring said actual idle speed toward said desired idle speed.

4,344,398

IDLE SPEED CONTROL METHOD AND SYSTEM FOR AN INTERNAL COMBUSTION ENGINE OF AN AUTOMOTIVE VEHICLE

Kenji Ikeura, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed May 28, 1980, Ser. No. 154,048
Claims priority, application Japan, May 29, 1979, 54-65661
Int. Cl.³ F02M *7/00*; F02D *1/04, 5/02*; G06F *7/70*
U.S. Cl. 123—339 **17 Claims**



1. A method for controlling idle air flow rate flowing through an idle air passage in an intake air flow rate control system for an internal combustion engine in which either one of closed loop control and open loop control is carried out selectively, said system including an idle control valve with an actuator being operative in response to a pulse signal that varies the ratio of an energized period and a deenergized period of said actuator according to the duty cycle of the pulse signal, said actuator having a normal duty cycle range in which it accurately follows variations of the duty cycle of said pulse signal without substantial delay, and dead bands in which said actuator causes substantial response delay with respect to variations of the duty cycle of the pulse signal, said dead bands defined by the duty cycle being higher than a predetermined maximum value or lower than a predetermined minimum value,

said method comprising the steps of;

determining engine speed;

determining engine temperature;

determining an open loop control value based on a determined engine temperature;

determining a reference engine speed based on the determined engine temperature;

determining a closed loop control value based on the determined engine speed and a difference between the determined engine speed and a reference engine speed;

producing said pulse signal having said duty cycle representative of a predetermined relationship involving the determined open loop and closed loop control values for operation in open loop control;

presetting maximum and minimum values of said duty cycle of said pulse signal, the range between said maximum and minimum values defining said normal duty cycle range corresponding to said dead bands of said actuator; and

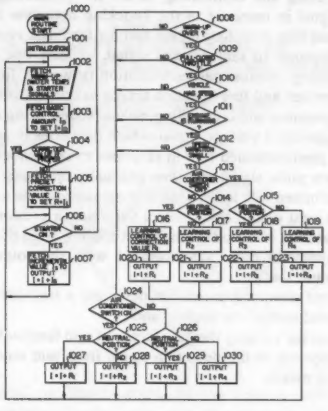
correcting the duty cycle of said pulse signal to maintain same within said normal duty cycle range.

4,344,399

METHOD AND APPARATUS FOR CONTROLLING ENGINE IDLING SPEED

Toshimi Matsumura, Ohbu; Norio Omori, and Hisamitsu Yamazoe, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 12, 1980, Ser. No. 186,449
Claims priority, application Japan, Sep. 14, 1979, 54-118155
Int. Cl.³ F02D *9/02, 31/00*
U.S. Cl. 123—339 **8 Claims**



1. In a method of controlling the idling speed of a throttle valve equipped engine of an automobile having an air conditioner system and a transmission, including the steps of preliminarily establishing a control amount which determines an idle air flow for providing a basic idling speed and adjusting said idle air flow in accordance with said control amount, the improvement comprising the steps of:

computing said control amount from a basic control amount and a variable correction value being maintained to a constant value during the warm-up of the engine;

computing a difference value between a target idle speed and an actual idle speed of the engine, computing the correction value from the difference value so that the actual idle speed is adjusted to the target idle speed, memorizing the computed correction value and computing the control amount from the memorized correction value and the basic control amount after the termination of warm-up of the engine; and

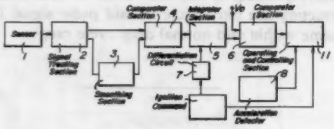
adjusting said idle air flow in accordance with said memorized correction value and said basic control amount under all the operating conditions of said engine including the idling operation thereof.

4,344,400

CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Masaharu Asano, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 30, 1980, Ser. No. 173,756
Claims priority, application Japan, Jul. 31, 1979, 54-97939
Int. Cl.³ F02D *5/04;* **F02P** *5/04;* **F02M** *7/00*
U.S. Cl. 123—425 **9 Claims**



1. A control device for an internal combustion engine comprising:

a sensor for detecting pressure variations in a combustion chamber of the engine or vibrations resulting from the pressure variations;

first detecting means for detecting a knocking state produced in the engine from the output signal of said sensor and for producing a knocking detection pulse signal;

operating and controlling means for generating a control signal in response to the knocking detection signal from said first detecting means and for feedback controlling, in response to said control signal, at least one of ignition timing, exhaust gas recirculation flow rate, fuel injection amount and fuel injection timing as control variables, said operating and controlling means further being operable to generate a voltage signal which decreases in amplitude at a predetermined rate in response to said knocking detection pulse signal and then gradually increases at a predetermined rate lower than said decreasing rate and controls at least one of said control variables in proportion to the value of said voltage signal at trailing edge of an ignition command pulse synchronized with the rotation of the crank shaft;

second detecting means for detecting a transitional driving condition of the engine; and

means for varying the gain factor of said feedback control in response to the detection signal from said second detecting means.

4,344,401

ELECTROSTATIC FUEL INJECTOR

Kenji Masaki, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

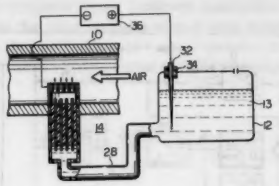
Division of Ser. No. 778,944, Mar. 18, 1977, Pat. No. 4,173,206. This application Jan. 3, 1979, Ser. No. 711
Claims priority, application Japan, Mar. 24, 1976, 51/31450; May 29, 1976, 51/61785
Int. Cl.³ F02B *51/04, 33/00;* **F02M** *27/04, 29/00*
U.S. Cl. 123—536 **13 Claims**

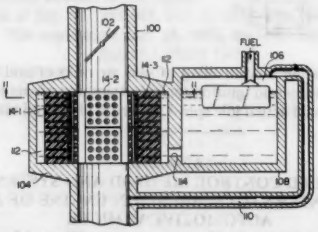
1. A fuel injection apparatus for combustion system, comprising:

a fuel supply container;

means for electrostatically charging said fuel;

a plurality of open-ended threadlike tubes arranged parallel with each other and connected at one end to said fuel supply container to allow said fuel to pass therethrough for delivery of fuel from the opposite end of each of said tubes; and





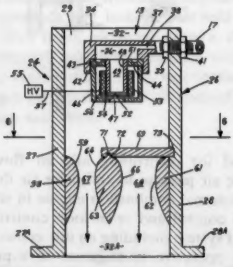
means for electrostatically attracting and accelerating the fuel delivered from said threadlike tubes.

4,344,402

FUEL SUPPLY SYSTEM

Francis W. Child, Eagle Bend, Minn. 56446, and Richard O. Bartz, 7017 Mark Terrace Dr., Edina, Minn. 55435

Division of Ser. No. 736,709, Oct. 29, 1976, Pat. No. 4,209,472. This application Dec. 13, 1979, Ser. No. 103,278
Int. Cl.³ F02B *3/00;* **F02M** *7/00;* **F02B** *33/00*
U.S. Cl. 123—538 **18 Claims**



1. An apparatus for supplying an air and fuel particle mixture to a means for using the mixture comprising: a housing having a passage adapted to carry an air and fuel particle mixture to the means for using the mixture, first means for introducing particles of fuel into the passage, said particles of fuel being mixed with air in said passage, said first means having a member surrounding a chamber accommodating liquid fuel and ultrasonic vibration means mounted on the member to vibrate the member and liquid fuel therein, said member having at least one orifice open to the chamber through which particles of fuel are introduced into the passage, said member of the first means is a cup-shaped member having a first wall and a second wall surrounding a chamber for accommodating liquid fuel, said orifice being located in said first wall, said ultrasonic vibration means including a collar mounted on the second wall operable to vibrate the liquid fuel in the chamber and the

member, a cap surrounding the collar, said cap having an orifice aligned with the orifice of the bottom wall whereby, when the ultrasonic vibrating means is operated, liquid fuel is dispensed through the orifices of the bottom wall and the cap as small particles of fuel into the passage, and second means mounted on the housing and located in the passage forming a venturi throat, said air and particles of fuel flow through the venturi throat to the means for using the mixture.

4,344,403

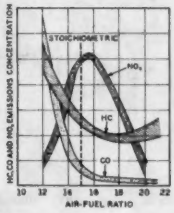
FUEL SUPPLY SYSTEM

Frances W. Child, Eagle Bend, Minn. 56446, and Richard O. Bartz, 7017 Mark Terrace Dr., Edina, Minn. 55435

Division of Ser. No. 736,709, Oct. 29, 1976, Pat. No. 4,209,472. This application Dec. 13, 1979, Ser. No. 103,411

Int. Cl.³ F02B *33/00, 3/00*

U.S. Cl. 123—538 **10 Claims**



1. An apparatus for supplying an air and liquid fuel particle mixture to a means for using the mixture comprising: a housing having a passage adapted to carry an air and liquid fuel particle mixtue to the means for using the air and liquid fuel particle mixture, first means for introducing particles of liquid into the passage, said particles of liquid fuel being mixed with air in said passage, said first means having a member surrounding a chamber accommodating liquid fuel and a body having a passage for carrying liquid fuel to the chamber, said member being mounted on the body, ultrasonic vibration means surrounding and mounted on the member to vibrate the member and liquid in said chamber, said member having at least one orifice through which particles of liquid fuel are introduced into the passage, said ultrasonic vibration means causing the breakup of liquid moving through said orifice into liquid particles, cover means surrounding the ultrasonic means, said cover means having an opening aligned with the orifice of said member and being attached to the body and engageable with the member to hold the member on the body, and second means comprising with the housing to direct the air and liquid fuel particle mixture to the means for using the air and liquid fuel mixture.

4,344,404

FUEL SUPPLY SYSTEM

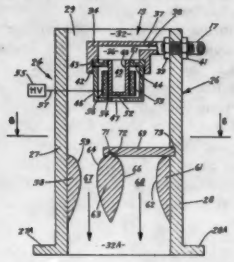
Francis W. Child, Eagle Bend, Minn. 56446, and Richard O. Bartz, 7017 Mark Ter. Dr., Edina, Minn. 55435

Division of Ser. No. 736,709, Oct. 29, 1976, Pat. No. 4,209,472. This application Dec. 21, 1979, Ser. No. 105,978

Int. Cl.³ F02B *3/00;* **F02M** *29/00*

U.S. Cl. 123—538 **9 Claims**

1. An apparatus for supplying an air and liquid fuel particle mixture to a means for using the mixture comprising: nebulizer means for receiving liquid fuel from a source of said fuel, said nebulizer means including a member having a chamber for carrying liquid fuel and ultrasonic vibration means cooperating with the member to subject the liquid fuel in said chamber of the member to ultrasonic vibratory energy, a pump for receiving liquid fuel from the nebulizer means, liquid fuel discharge means receiving liquid fuel under pressure from the pump and discharging the liquid as liquid fuel particles, and nozzle means for receiving the liquid fuel particles from the discharge means and mixing the liquid fuel particles with air, and discharging the liquid fuel particles and air mixture to the means for using the mixture, said nozzle means having means forming a first venturi throat and a second venturi throat, said first venturi throat being unobstructed and smaller than said second venturi throat, said first and second venturi throats receiving air and



the liquid fuel particles from the discharge means and directing the mixture of air and liquid fuel particles to the means for using said mixture, and control means for controlling the flow of air and liquid fuel particles only through said second venturi throat, said first venturi throat remaining open at all times.

4,344,405

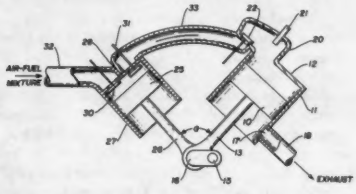
INTERNAL COMBUSTION ENGINE

Edward J. Zaharis, 18728 Bollinger Canyon Rd., San Ramon, Calif. 94583

Filed Dec. 22, 1980, Ser. No. 218,350

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—568 **7 Claims**



1. An internal combustion engine having a piston connected to reciprocate in a cylinder and to operate a work device, with the cylinder having an inlet for a combustible mixture of air and fuel and an outlet for exhaust, comprising said inlet adapted to maintain said combustible mixture as a substantially undiluted body of gas, means to fill the cylinder with one of said combustible mixture and said exhaust gas before the compression stroke of said piston begins, and a pump for supplying the other of said combustible mixture and said exhaust gas to the interior of the cylinder and adapted to supply half of said other gas after the outlet for exhaust is closed.

4,344,406

FUEL SAVER

Robert N. Minor, Stafford Springs, Conn., and Edward J. F. Cloutier, Sturbridge, Mass., assignors to Gasaver Corp., New Britain, Conn.

Continuation-in-part of Ser. No. 62,521, Aug. 2, 1979, abandoned. This application Jul. 22, 1980, Ser. No. 167,860

Int. Cl.³ F02M *23/08*

U.S. Cl. 123—587 **25 Claims**

1. A device responsive to a vacuum in an intake manifold of an internal combustion engine for improving fuel economy by controlling said intake manifold vacuum during a plurality of

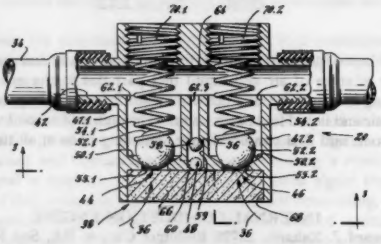
different engine operating modes, each of which has a characteristic range of vacuum levels, comprising:

a first normally closed control valve adapted when opened to provide a first supplemental air source to said intake manifold during at least a first engine mode;

a second normally open control valve adapted when opened to provide a second supplemental air source to said intake manifold during at least a second engine mode; and

means for pneumatically coupling said first and second control valves to said intake manifold;

said first control valve being constructed and arranged to open when the vacuum in said intake manifold exceeds a predetermined upper limit of the characteristic vacuum range for said first engine mode to deliver a controlled quantity of air to said intake manifold thereby reducing the amount of fuel being drawn from a carburetor into said intake manifold during at least said first engine mode;



said second normally open control valve being constructed and arranged to close when the vacuum in said intake manifold exceeds a predetermined lower limit of the characteristic vacuum range for said second engine mode and to open when the vacuum in said intake manifold drops below said predetermined lower limit of the characteristic vacuum range for said second engine mode to deliver a controlled quantity of air to said intake manifold thereby reducing the amount of fuel being drawn from said carburetor into said intake manifold during at least said second engine mode, said predetermined upper limit of the characteristic vacuum range for said first engine mode being greater than said predetermined lower limit of the characteristic vacuum range for said second engine mode to provide a vacuum range wherein both said valves are closed.

4,344,407

CYLINDER HEAD, PORTS, AND PISTON CONFIGURATION

Masami Konishi, Toyota; Akio Kuramoto, Okazaki; Yorishige Maeda, Toyota; Norikatsu Ishikawa, Mishima, and Makoto Suzuki, Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 7, 1979, Ser. No. 101,236

Claims priority, application Japan, Mar. 5, 1979, 54-25364

Int. Cl.³ F02B *23/08*

U.S. Cl. 123—661 **3 Claims**

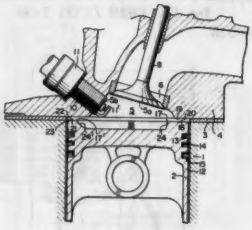
1. In an internal combustion engine having a cylinder block with a cylinder bore therein, a piston reciprocatingly movable within the cylinder bore, a cylinder head comprising a surface facing and closing one end of the bore, and inlet and exhaust ports and a spark plug in the cylinder head, the combination comprising:

first and second planar regions on the surface of the cylinder head facing the cylinder bore, the first and second regions being on opposite sides of a phantom plane that includes the axis of the cylinder bore;

first and second planar regions on the end surface of the piston facing the first and second portions of the surface of the cylinder head to form therewith first and second squish areas, respectively;

a piston depression in the end surface of the piston between the first and second regions of the end surface, the piston depression comprising a contour that includes a portion on one side thereof substantially coincident with the peripheries of the inlet and exhaust ports, the remainder of the surface of the piston depression on an opposite side thereof comprising an arcuate surface substantially coaxial with the periphery of the piston; and

a cylinder head recess between the first and second regions of the surface of the cylinder head, the cylinder head recess being substantially opposite the piston depression to



form therewith a combustion chamber that extends on opposite sides of the planar regions of the cylinder head and the planar regions of the piston, the inlet and exhaust ports having axes located toward the same side of the phantom plane as the first squish area, the spark plug extending through the cylinder head on the opposite side of the phantom plane from the inlet and exhaust port axes and having an igniting tip close to the axis of the cylinder bore and close to the planes of the planar regions defining the squish areas, the first squish area on the same side of the phantom plane as the axes of the ports being larger than the second squish area on the same side of the phantom plane as the spark plug.

4,344,408

CYLINDER HEAD, SPARK PLUG, AND PISTON CONFIGURATION

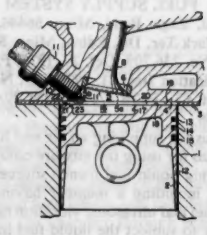
Tokuta Inoue, Mishima; Kiyoshi Nakanishi; Mutsumi Kanda, both of Susono; Masahiko Nakada, Okazaki, and Toshiharu Matsuura, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 7, 1979, Ser. No. 101,238

Claims priority, application Japan, Mar. 5, 1979, 54-25363

Int. Cl.³ F02B *23/08*

U.S. Cl. 123—661 **10 Claims**



1. In an internal combustion engine having a cylinder bore: the combination of a cylinder head which closes an end of said cylinder bore and has a plane surface facing the bore, a piston with a plane end surface opposing the cylinder head which reciprocates within the bore to such an extent

that at one end of its travel its said plane end surface comes in close proximity to said plane surface of the cylinder head, at least an inlet valve having a valve head, and a spark plug with an igniting tip;

the piston being formed with a piston depression delimited by said plane end surface of the piston, and the cylinder head being formed with a cylinder head depression at least partly delimited by said plane surface of the cylinder head and at least partially opposing said piston depression, the volume of either one of the piston depression and the cylinder depression being not more than 50 percent greater than the volume of the other;

the spark plug being mounted in the cylinder head so as to project into the cylinder head depression with its igniting tip substantially in said plane surface of the cylinder head in a position offset from the axis of the cylinder bore, said valve head being inclined upwardly toward the side of said cylinder head depression where said spark plug is located; and

said plane surface of the cylinder head and said plane end surface of the piston defining between them a main squish area of crescent shape when the piston is at said one end of its travel, said main squish area being generally on the opposite side of the axis of the cylinder bore from said igniting tip of the spark plug.

4,344,409

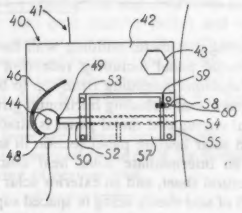
ARROW REST APPARATUS

Roland K. Barner, 119 Sunset Blvd., Bozeman, Mont. 59715

Filed Jul. 25, 1980, Ser. No. 172,386

Int. Cl.³ F41B *5/00*

U.S. Cl. 124—24 R **14 Claims**



1. Arrow rest apparatus capable of being mounted on an archery bow adjacent the point of contact of an arrow with said bow, said arrow rest apparatus including support means for aiding in mounting said arrow rest apparatus on an archery bow, said arrow rest apparatus further including a shaft member rotatably carried by said support means, said shaft member being oriented so that the axis thereof is substantially perpendicular to the axis of said arrow, first biasing means urging rotation of said shaft member in one direction, arrow supporting means affixed to said shaft member for supporting an arrow in a position to be propelled, latch means operatively connected to said shaft member, second biasing means urging said latch means into a position to retain said shaft member against rotation in said one direction, an arm portion moveably mounted on said support means, said arm portion including a weighted section, said weighted section resisting movement of said arm portion upon release of an arrow allowing relative movement between said latch means and said arm portion and said latch means will release said shaft member for rotation in said one direction, and means for releasably mounting said support means on an archery bow.

4,344,410

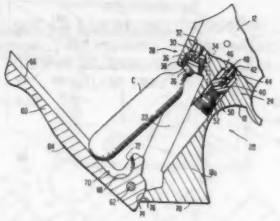
GAS-FIRED GUN WITH GAS CARTRIDGE LOADING AND EXTRACTION ASSEMBLY

Roger J. Curran, Stratford, Conn., assignor to Victor United, Inc., Rogers, Ark.

Continuation of Ser. No. 96,119, Nov. 20, 1979, abandoned, which is a continuation of Ser. No. 930,275, Aug. 2, 1978, abandoned. This application Feb. 27, 1981, Ser. No. 238,860

Int. Cl.³ F41B *11/06*

U.S. Cl. 124—80 **18 Claims**



9. A gas-fired gun comprising:

a gun frame having a barrel and a handgrip including a fixed body portion;

means defining an elongated chamber in said handgrip body portion for receiving a gas-containing cartridge;

means carried by the gun adjacent one end of said chamber for releasably retaining one end of the gas cartridge within said chamber and including means for piercing said one end of the cartridge,

a gas cartridge extraction assembly forming a part of said handgrip and including a lever coupled to said handgrip body portion for pivotal movement about an axis adjacent the opposite end of said chamber and movable between a position closing said chamber and a position opening said chamber enabling extraction of the gas cartridge from the chamber,

said gas cartridge extraction assembly further including surface means at the opposite end of said chamber on said lever and movable therewith laterally outwardly from the chamber about said axis for engaging the opposite end of the gas cartridge in response to pivotal movement of said lever from its chamber closing position toward its chamber opening position to displace the cartridge outwardly of said chamber and enable release of the one cartridge end from said releasable retaining means,

said surface means being located on the inboard side of an imaginary line extending between said pivotal axis and said piercing means when the lever is in said position closing the chamber, said lever moving away from said imaginary line in the outboard direction as the lever moves from the chamber closing to the chamber opening position, said chamber being open and unobstructed from said one end thereof to said surface means when the lever is in said chamber closing position whereby to define an area for the acceptance of a cartridge that extends from said one end of the chamber to said surface means.

4,344,411

HEAT EXCHANGER FOR SPACE HEATERS

Howard K. Dearborn, 80 Portland St., Fryeburg, Me. 04037

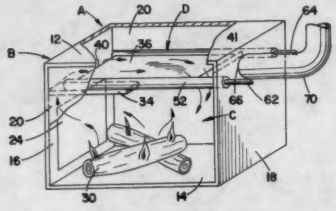
Filed Jun. 7, 1979, Ser. No. 46,347

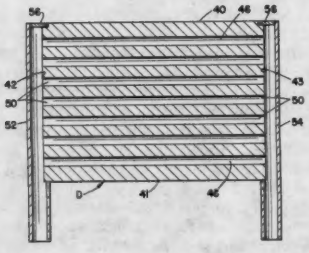
Int. Cl.³ F24C *13/00*; F28F *3/12*

U.S. Cl. 126—34 **16 Claims**

1. A heat exchanger for fuel burning heating stoves comprising: a plate having substantially parallel opposite faces and an outer periphery, a plurality of individual spaced-apart substantially parallel elongated holes entering said plate at said outer periphery and extending between said opposite faces substantially parallel thereto, said holes being spaced-apart in a direc-

tion extending substantially parallel to said faces, said holes being of substantially the same diameter and being spaced-apart substantially equidistantly, said plate having a thickness not greater than two times the diameter of one said hole, said holes being spaced from one another such that the plate material between adjacent holes has a width at least as great as the diameter of one said hole and not greater than approximately two times the diameter of one said hole, inlet and outlet openings for said holes, manifold means attached to said plate for





circulation of liquid through said holes between said inlet and outlet openings, said plate being mountable to structure defining at least part of a solid fuel burning space heater in heat exchange relationship with the heat produced by combustion of such fuel therein for heating liquid circulating through said holes between said inlet and outlet openings, and said plate having reduced areas at each end relative to said manifold means whereby upon installation combustion products may circulate about said reduced areas.

4,344,412

LOG SUPPORTING RACK FOR USE IN A FIREPLACE

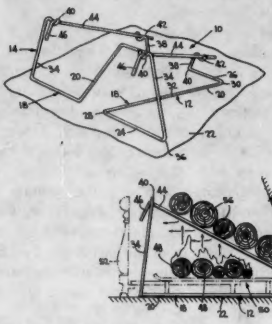
James Perrin, 3700 Prince William Dr., Fairfax, Va. 22031

Filed Jan. 13, 1981, Ser. No. 224,497

Int. Cl.³ F24B *13/00*

U.S. Cl. 126—298 **6 Claims**

1. A rack for supporting logs in a rearwardly declined pattern over a burning fire on the hearth of a fireplace comprising a pair of frames composed of rods and being arranged in a selectively spaced part, side by side, structurally unconnected relation, single substantially z-shaped rod adapted to rest flat on the hearth and having opposing front and rear end portions and vertical sections upstanding from the base, one of said vertical sections being the front section upstanding from the front end portion of the base rod and the other being the rear section upstanding from the rear end portion of the base rod with the front section being higher than the rear section and rod members extending between and supported by said sections, wherein upon which logs can be placed in a rearwardly declined pattern above the furning fire with the logs being suspended over the burning fire to char and burn and, thus,



radiate their heat both into the room and back down at the fire underneath.

4,344,413

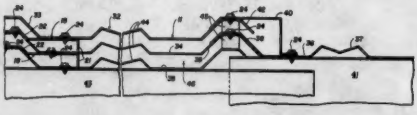
SOLAR HEATING PANEL FOR METAL BUILDINGS

Neil A. Watkins, and Clayton H. Richardson, Jr., both of Starkville, Miss., assignors to Gulf States Manufacturers, Inc., Starkville, Miss.

Filed Apr. 21, 1980, Ser. No. 142,219

Int. Cl.³ F24J *3/02*

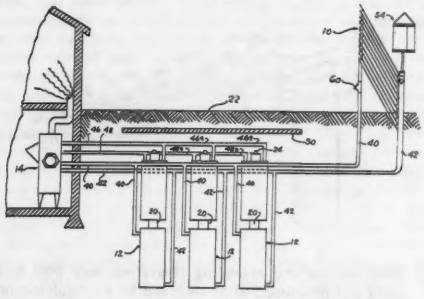
U.S. Cl. 126—429 **3 Claims**



1. In a corrugated metal building wall having a structural corrugated metal panel including recurring laterally spaced parallel corrugations extending from top to bottom thereof in a regular pattern, and including horizontal girt means to which the structural corrugated metal panel is attached for support, an integrated solar heating panel section in said building wall comprising an intermediate solar heat absorbing sheet, an interior structural sheet, and an exterior solar energy transmitting sheet, all of said sheets being in spaced superposed parallel relationship and each sheet having spaced recurring corrugations extending from top to bottom thereof in the same pattern as the corrugations of said structural corrugated metal panel, girt means for the support of the solar panel heating section attached to the interior sheet thereof, the intermediate sheet forming effectively an uninterrupted continuation of said structural corrugated metal panel and the intermediate sheet and structural corrugated metal panel having overlapping and interfitting end corrugations, fastener means attaching said end corrugations in interfitting relationship, the exterior sheet of the integrated solar heating panel section being spaced forwardly of the structural corrugated metal panel and having an end corrugation adjacent to said interfitting corrugations, and a transition flashing extending from top to bottom of said building wall at the vertical juncture of the structural corrugated metal panel with said solar heating panel section, the transition flashing being attached to the structural corrugated metal panel near said juncture and including a forward wall which overlaps said end corrugation of the exterior sheet and being attached to such end corrugation, the transition flashing serving to cover and conceal said juncture, and continuous top to bottom closure strips disposed between said end corrugation of the exterior sheet and said interfitting corrugations and

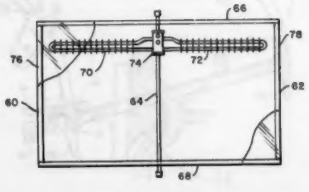
between the interfitting corrugations and an adjacent end corrugation of said interior structural sheet of the solar panel heating section, said interior structural sheet being spaced inwardly of the structural corrugated metal panel at said juncture.

4,344,414
SOLAR-EARTH THERMAL SYSTEM
Joseph C. Balch, S.R. Box 90550, Fairbanks, Ak. 99701
Continuation-in-part of Ser. No. 898,864, Apr. 21, 1978, Pat. No. 4,205,718. This application Feb. 6, 1980, Ser. No. 119,185
Int. Cl.³ F24J 3/02
U.S. Cl. 126—434 **4 Claims**



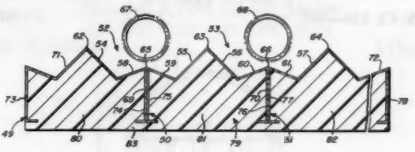
1. A heating system comprising:
(a) means for collecting and transfering heat to a fluid medium,
(b) at least one fluid thermal unit comprising an elongated thermal tube for conducting heat from one end thereof to the other end thereof, and a heat transfer jacket at said one end of said thermal tube for receiving said fluid and for conducting said heat to said one end,
(c) duct means for conducting said fluid from said means for collecting to said heat transfer jacket and wherein said fluid thermal element is buried in the earth so that said one end of said elongated thermal tube is below the other end of said elongated thermal tube and said heat transfer jacket receives said fluid from said means for collecting and transfering heat,
whereby heat from said means for collecting and transferring may be transmitted to the earth for storage thereof or for the thawing of permanfrost.

4,344,415
SOLAR COLLECTOR
Edward W. Bottum, 9357 Spencer Rd., Brighton, Mich. 48116
Filed Apr. 8, 1980, Ser. No. 138,294
Int. Cl.³ F24J 3/02
U.S. Cl. 126—434 **6 Claims**



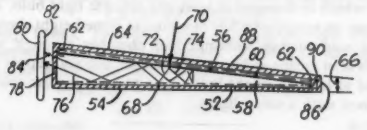
1. A solar collector comprising a generally rectangular enclosure having parallel, horizontally extending, vertically spaced apart top and bottom, two parallel, vertically extending, horizontally spaced apart sides, and parallel, vertically extending, horizontally spaced apart front and back, said back having a heat absorbing surface facing the inside of the enclosure, a single transfer conduit for a heat exchange medium extending into the bottom and out of the top of the collector enclosure, a U-shaped collector coil having opposite ends in the same plane in communication with said transfer conduit within the collector enclosure adjacent the top thereof and extending substantially horizontally therein, and an accumulator positioned in the transfer conduit adjacent the top of the collector enclosure through which the collector coil is connected to the transfer conduit.

4,344,416
SOLAR ENERGY COLLECTOR
Charles R. Kemper, 3487 Far Hills Ave., Kettering, Ohio 45429
Filed Jan. 25, 1980, Ser. No. 115,334
Int. Cl.³ F24J 3/02
U.S. Cl. 126—438 **2 Claims**



1. A solar energy collector having a heat absorbing medium, a thermally conductive chamber for housing said medium and structure for exposing said chamber to solar rays, wherein the improvement comprises means for reflecting and re-reflecting solar rays not directly striking said chamber on to the surfaces thereof not directly struck by solar rays wherein said means are in the form of a reflective surface characterized by a compound angular cross section, said reflective surface comprises at least one trough defined by upwardly divergent sidewalls spanned at their base by tented bottom wall segments, said chamber is at least one hollow tube at least partially nested within said trough and said trough is formed by at least two channels each having a compound angular upper surface comprising a pair of interior strips converging at their upper edges in a high peak and a pair of exterior marginal strips from the outer edge of each of which depends a web, said channels being held together in side-by-side abutting relationship whereby their high peaks define the trough whereof the sidewalls are the opposing interior strips and the tented bottom wall segments are the adjacent marginal strips.

4,344,417
SOLAR ENERGY COLLECTOR
Jan Malecek, 245 E. 77th St., New York, N.Y. 10021
Filed Oct. 21, 1980, Ser. No. 199,155
Int. Cl.³ F24J 3/02
U.S. Cl. 126—439 **8 Claims**



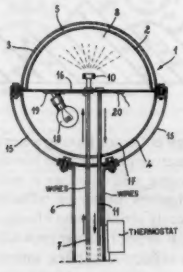
1. A solar energy collector comprising a generally wedge-shaped body, said wedge-shaped body having a pair of adjacent lateral surfaces separated by a discrete angle, a heat activated energy absorbing apparatus, said energy absorbing apparatus being disposed outwardly of said body and opposite said discrete angle, means to receive light rays into said body passing through one of said pair of surfaces, means to convert said light rays into heat energy impinging on said energy absorbing

apparatus, means to direct the heat energy contained within said light rays passing through said first surface towards said energy absorbing apparatus, wherein said means to direct comprises said body being a housing, said one of said pair of surfaces having an interior side thereof being coated with a light transmissive heat reflecting material, said housing having a cavity, said cavity containing a light absorbing heat generating surface of material therein, said heat generating surface being disposed parallel to the other of said pair of surfaces.

4,344,418
SOLAR COLLECTOR

Claude Leroy, Marseilles, France, assignor to Cosmos Investigations and Research Societe Francaise a Responsabilite Limitee, Levallois-Perret, France

Filed Jul. 9, 1980, Ser. No. 167,013
Claims priority, application France, Jul. 16, 1979, 79 18336; Mar. 31, 1980, 80 07224
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—443 **6 Claims**



1. A solar collector comprising an outer semisphere and an inner semisphere having an inner wall surface, said outer semisphere and said inner semisphere being concentric with one another and having bases, said outer semisphere being permeable to solar radiation, and said inner semisphere being absorbent of the solar radiation; inlet means and outlet means for fluid to be heated, said inlet means including a duct prolongated upwardly inside an inner semispherical chamber defined by said inner semisphere; a spray head carried by said duct on its end and capable of projecting fluid to be heated onto said inner wall surface of said inner semisphere so that the fluid flows while being heated along said inner wall surface before being collected at said outlet means, said outlet means being positioned in a lowestmost point of said inner semispherical chamber; a substantially horizontal wall extending over the bases of said outer semisphere and said inner semisphere which, with said wall, defines said inner semispherical chamber, in which is sprayed fluid to be heated, in combination with a further semispherical chamber fixed beneath said wall and inside which is disposed at least one electric light bulb, a support post on top of which is mounted at some height above the ground said further semispherical chamber through which extends inlet means and said outlet means and also supply wires for said at least one light bulb, so as to form a solar collector combined with a street light.

4,344,419
ACRYLOOPTIC TONGUE DEPRESSOR AND HANDLE THEREFOR

Kermit Burgin, R.R. #1, Box 334, Whitestown, Ind. 46075

Filed Dec. 20, 1979, Ser. No. 105,509
Int. Cl.³ A61B *1/06*
U.S. Cl. 128—18 **7 Claims**

5. An examination instrument, comprising

a base unit having a handle portion providing a hand grip and a head portion;

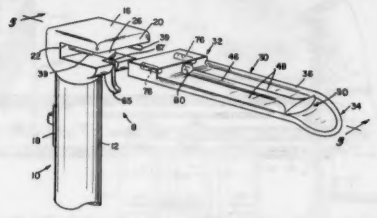
a light source mounted in the head portion for providing light in the head portion of said base unit;

a light-transmissive examination member having a proximal end for engaging the head portion of the base unit and a distal end for contacting a body surface to be examined;

a lens formed on the examination member for directing light onto the body surface being examined;

a means for removably attaching the proximal end of the examination member to the head portion of the base unit such that said examination member is attached adjacent the light source;

attachment means including a post member provided on the



head portion and extending therefrom, said post being sized and positioned to be received by a complementary interfitting opening on the examination member for guiding, positioning, and maintaining the examination member upon the head portion of the base unit;

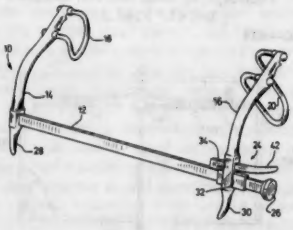
means for selectively disengaging said examination member from the head portion of said base unit, said selective disengagement means including a trigger movably mounted on the head, a cam means coupled to the trigger, said cam means being actuable by the trigger to disengage said member from said head,

said trigger and cam means being positioned on the base unit so that actuation of the trigger causes the cam to apply pressure to the examination member in substantially the same direction as the post extends.

4,344,420
SURGICAL RETRACTOR

William C. F. Forder, 33 Rosehill Ave., Apt. 1903, Toronto, Ontario, Canada M4T 1G4

Filed May 15, 1980, Ser. No. 150,083
Claims priority, application Canada, May 2, 1980, 351176
Int. Cl.³ A61B *17/02, 1/32*
U.S. Cl. 128—20 **13 Claims**



1. A surgical retractor for renal surgery consisting essentially of a pair of arm means mounted on a single, generally rectangular in cross section, elongated cross member, a first arm means of the pair being generally fixed to the cross member adjacent one end thereof, the second arm means of the pair being generally fixed to a rectangular sleeve member slidably

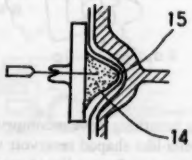
mounted on said cross member, each of the arm means having blade means extending therefrom adjacent their free ends away from said cross member for engaging the opposite edges of a surgical wound and separating such edges by sliding the second arm means along the cross member away from the first arm means, a plurality of aligned holes being spaced along said cross member, and pin-nosed pawl locking means for securely retaining the second arm means in a selected one of a plurality of positions along the cross member in spaced relationship to a selected one of said plurality of aligned holes, said pin-nosed pawl locking means comprising a pawl pivotably mounted on the second arm means, said pawl member having a projecting pin portion adapted to be engagingly received in one of said holes and a digitably engageable trigger portion for releasing said pin portion from engaging reception in said one of said holes, said pawl member being spring loaded to bias the pin portion against said cross member, a first side of said rectangular cross bar lying against the patient during surgical use, a second side of said rectangular cross bar having said arm means extending therefrom at generally right angles to said first side, said plurality of aligned holes and said pin-nosed pawl locking means being located on said second side, said first and second arm means being curved in a direction which is generally toward said first side of said cross member, and in the direction in which the blade means extend into the surgical wound, so that the renal retractor lies generally adjacent to and in contact with the patient's flank during use in renal surgery, a third side of said rectangular cross member being located generally opposite said first side of said cross member being substantially free of projections extending beyond said sleeve member so as to permit greater accessibility to the wound and reduce accidental contact by operating room personnel with said renal retractor during use, said second arm means, said cross member, said sleeve member, and said locking means cooperating to provide a smooth, very sensitive, and non-obstructing translation of said second arm means along said cross bar, combined with a positive self-locking yet easily released locking mechanism for easy positioning and retention of the instrument in said surgical wound in that said second arm may be secured in the selected locked position along the cross member by holding the trigger portion of said pawl locking means to disengage the projecting pin portion from said holes and sliding said second arm means, said sleeve member, and pin-nosed pawl locking means along said cross member to a desired position, whereupon digital release of said trigger portion causes the pin portion to become engaged in the first of the holes the pin portion reaches after such release to securely retain said second arm means in the thus locked position against pressure of the incision against the arm means until the trigger portion is digitally engaged.

4,344,421

APPARATUS FOR THE FAST, PAINLESS TREATMENT OF VARICOSE ULCERS

Raoul Bareiss, 2, rue de la gare, 68 500 Saint Amarin, France

Filed Jun. 24, 1980, Ser. No. 162,617
Claims priority, application France, Jun. 29, 1979, 79 17435
Int. Cl.³ A61H *1/00*
U.S. Cl. 128—24 R **3 Claims**



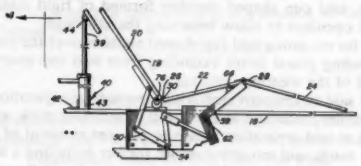
1. A mechanical device for the ambulatory treatment of varicose ulcers, comprising a support body attached to the skin of the patient over the varicose ulcer, pressure establishing means on said support body for applying a continuous localized external inwardly applied pressure only in the area of the perforating varix for forcing the blood back to the deep venous system by the application of pressure applied from the exterior to the interior of the dehiscense of the tissues occupied by the perforating varix, wherein said support body includes a base portion, and further including an impermeable film overlying the base and peripherally sealed to the support body, a peripheral adhesive applied to external portions of the impermeable film overlying said base portion for holding the device on the leg skin of the patient and means traversing the body of the support body for injecting fluid between the base portion and the external film to cause the external film to bulge outwardly from the base portion to effect the application of pressure applied from the exterior to the interior of the dehiscense of the tissues occupied by the perforating varix.

4,344,422

ORTHOPEDIC BED

Joseph D. Immel, 4809 Green Acres Rd., St. Joseph, Mo. 64506

Filed Jun. 5, 1980, Ser. No. 156,696
Int. Cl.³ A61H *1/00*; A47C *20/08*
U.S. Cl. 128—33 **9 Claims**



1. An orthopedic bed comprising a frame, a mattress support structure mounted on said frame, said mattress support structure including three hinged sections, said hinged sections comprising a head support section, intermediate section and foot support section; a pivot tube connected to said frame, said pivot tube also being attached to said head support and intermediate sections for limiting movement thereof to pivotable movement about said tube; linkage means connected to said head support section and said intermediate section for causing pivotal movement of said intermediate section upon pivotal movement of said head support section; said linkage means including a first bell crank, a first control arm extending from said head support section to one side of said first bell crank, a second bell crank, a second control arm extending from said first bell crank to said second bell crank, a support rod extending from said second bell crank, said intermediate section resting upon said support rod, an eccentric shaft disposed in said pivot tube and having a motor attached to said eccentric shaft for causing rotation thereof thereby vibrating said mattress support structure, and power lift means attached to said head support section for lifting said head support section.

4,344,423

ORTHOPEDIC BANDAGE HAVING IMPROVED CATALYST SYSTEM

Anthony Evans, Teaneck; John M. Lesniak, and Franklin Boardman, both of Englishtown, all of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Sep. 6, 1977, Ser. No. 830,731
Int. Cl.³ A61F *5/04*
U.S. Cl. 128—90 **9 Claims**

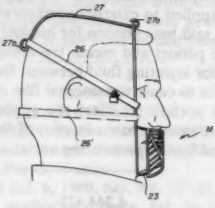
1. An orthopedic bandage comprising a flexible carrier having a cast forming composition adhered thereto, said cast forming composition comprising a redox catalyst system consisting essentially of cupric acetylacetonate in combination with a reducing agent, and a monomer, selected from the group consisting of diacetone acrylamide, N-isopropylacrylamide and mixtures thereof, which is polymerizable by means of said redox catalyst system.

4,344,424

ANTI-EATING FACE MASK

Lucy L. Barmby, 9550 Jackson Rd., Sacramento, Calif. 95826

Filed Mar. 27, 1980, Ser. No. 134,557
Int. Cl.[3] A61F *5/56*
U.S. Cl. 128—136 2 Claims



1. A face mask for preventing the introduction of substances into the mouth of the wearer comprising in combination;

a cup shaped member conforming generally to the shape of the mouth and chin area of the wearer's face below the nose, said cup shaped member formed of rigid material with openings to allow breathing therethrough,

means for mounting said cup shaped member over the mouth including plural straps extending from said cup over the head of the wearer,

one of said straps provided with a means for separation to allow for placement and removal of said face mask, and a lock at said separation means to prevent removal of said face mask, said mounting means further including a hoop member of rigid material adapted to extend over the user's head and chin and a flexible strap having end portions connected to said hoop member for extending around the back of the user's head and a strap member adapted to extend over the top of the user's head, said strap member being connected at opposite ends to said hoop member and to said strap intermediate the ends of said strap, said separation means including a staple adjacent one end portion of said strap, and an aperture in said strap one end portion in longitudinally spaced relationship with said staple, said strap one end portion arranged to be looped around said hoop member for insertion of said staple in said aperture and said lock engageable with said staple extending through said aperture for locking said strap one end portion to said hoop member, wherein said hoop member is attached to said cup shaped member by plural rods extending therebetween, two of said rods attached to opposed sides of said cup shaped member, a third said rod attached to a lowermost portion of said hoop member.

4,344,425

EARPLUGS

Richard H. Strauss, 1501 Doone Rd., Columbus, Ohio 43221

Filed Jun. 10, 1980, Ser. No. 158,276
Int. Cl.[3] A61F *11/02*
U.S. Cl. 128—152 6 Claims

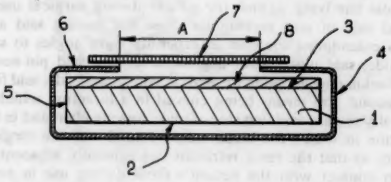
1. An earplug comprised of a preformed concave-convex imperforate disc of pliable stretchable film of a size and shape such that the convex surface thereof is adapted to conform to and cover the opening of the ear canal and such that the disc is adapted to reside within the external ear when positioned over the ear canal opening, and a layer of pressure-sensitive adhesive on the convex surface for releasably adhering the disc to the periphery of the ear canal opening.

4,344,426

STERILIZABLE SURGICAL PAD

Jean-Francois Caumont, Brionne, France, assignor to Tempo Sanys, Paris, France

Filed Jun. 30, 1980, Ser. No. 164,462
Claims priority, application France, Dec. 10, 1979, 79 30253
Int. Cl.[3] A61L *15/00*
U.S. Cl. 128—156 7 Claims



1. A sterilizable surgical pad comprising:

a flat core made from an absorbent material held in shape by means of a sheet of a natural or artificial textile material;

said textile sheet surrounding the inner and side surfaces of the core and folded over the edges of the outer surface of said core;

said textile sheet being held around the core by means of an impermeable co-extruded thermoplastic film adhered to both the outer surface of the core and the outer surface of the edges of the textile sheet which have been folded over the outer surface of the core;

said film being able to withstand temperatures necessary to effect heat-sterilization.

4,344,427

UNDERWATER BREATHING DEVICE

Mark C. Marvin, 25 Floral Rd., Peekskill, N.Y. 10566

Filed Mar. 24, 1980, Ser. No. 133,336
Int. Cl.[3] B63C *11/00*
U.S. Cl. 128—200.25 3 Claims

1. An underwater breathing device comprising:

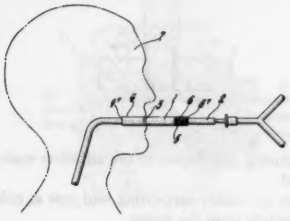
a non-rigid umbrella-like shaped reservoir which is capable of collecting rising gas from a liquid medium, said reservoir having a wide gas intake opening at one end and at essentially the apex end, a reservoir exhaust port through which gas is extracted from said reservoir, said exhaust port terminating in a breathing tube means.

4,344,428

ORAL ENDOTRACHEAL TUBE PROTECTOR, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Stanley Sherman, 2543 Wickfield Rd., West Bloomfield, Mich. 48033

Filed Feb. 20, 1980, Ser. No. 122,872
Int. Cl.[3] A61M *25/00*
U.S. Cl. 128—207.14 10 Claims



1. A tube member for removably receiving an endotracheal tube having a proximal end portion adapted to be inserted into a trachea of a patient and a distal end portion adapted to extend exterior to the mouth of a patient, comprising:

cylinder means having a bore extending therethrough for removably receiving and passing an endotracheal tube therethrough;

said cylinder means having a proximal end portion, an intermediate portion and distal end portion;

said proximal end portion and intermediate portion having a continuous, uninterrupted constant diameter, cylindrical outer surface;

said distal end portion of said cylinder means having first means integral therewith for securing said distal end portion to the distal end portion of said endotracheal tube, said first means comprising said distal end portion of said cylinder means having an uneven outer surface to which tape may be attached; and

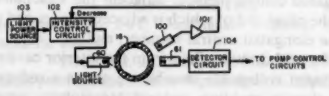
said cylinder means having a length with respect to said endotracheal tube such that, when said endotracheal tube is inserted with the trachea and said cylinder means is in its operative position on said endotracheal tube with said distal end portion of said cylinder means secured to the distal end portion of said endotracheal tube, said proximal end portion of said cylinder means is disposed within the mouth and terminates substantially forwardly of the throat of a patient and said intermediate portion and distal end portion extend exterior to the mouth of the patient.

4,344,429

BUBBLE DETECTOR WITH FEEDBACK CIRCUIT FOR IMPROVED SENSITIVITY

John E. Gupton, Vernon Hills, and Norman Shim, Glenview, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 13, 1979, Ser. No. 103,057
Int. Cl.[3] A61M *5/14;* G08B *21/00*
U.S. Cl. 128—214 R 7 Claims



1. A bubble detector for signaling the occurrence of a fluid absence in a fluid administration set, of the type having a transparent tubing segment of generally cylindrical cross section, said bubble detector comprising, in combination:

a light source arranged at one side of the tubing segment:

a first light detector generally arranged at the opposite side of the tubing segment opposite said light source and defining in conjunction with said light source a light path through the tubing segment, said first detector generating a first output signal indicative of the intensity of light from said light source incident thereon, the intensity of said incident light increasing in the presence of fluid within the lumen of the tubing segment as a result of the focusing effect thereof;

a second light detector generally arranged at an angle to said light path, said second detector generating a second output signal indicative of the intensity of light from said light source incident thereon, the intensity of said incident light decreasing in the presence of fluid within the lumen of the tubing segment as a result of the focusing effect thereof;

detector circuit means responsive to said first detector output signal for providing an alarm signal upon the intensity of the light incident on said first light detector falling below a predetermined minimum level; and

intensity control means responsive to said second detector output signal for decreasing the light output of said light source upon the light incident on said second detector increasing to increase the effectiveness of said control circuit means in responding to the absence of fluid in the lumen

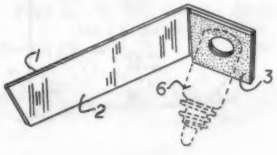
---

4,344,430

MEDICATION DIRECTING AID

Edgar Astrove, 35 Stratton Rd., Scarsdale, N.Y. 10583

Division of Ser. No. 90,330, Nov. 1, 1979, abandoned. This application Mar. 20, 1981, Ser. No. 246,117
Int. Cl.[3] A61M *1/00*
U.S. Cl. 128—233 9 Claims



1. A medication directing aid characterized by:

(a) a carrier having a mirror arm and a medication dispenser clamping arm formed of self-supporting flexible material at an obtuse angle;

(b) a mirror viewing surface on the mirror arm of said carrier (a); and

(c) clamping means associated operatively with the medication dispenser clamping arm of said carrier, to clamp a medication dispenser in place, comprising adhesive material disposed about a locating point on said clamping arm so as to present an adhesive clamping face on said carrier (a).

4,344,431

POLYMERIC ARTICLE FOR DISPENSING DRUGS

Seymour Yolles, Newark, Del., assignor to University of Delaware, Newark, Del.

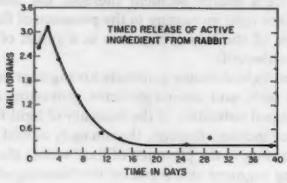
Continuation of Ser. No. 798,535, Dec. 12, 1974, abandoned, which is a division of Ser. No. 102,432, Dec. 29, 1970, Pat. No. 3,880,991, which is a continuation-in-part of Ser. No. 809,946, Mar. 24, 1969, abandoned. This application Aug. 4, 1980, Ser. No. 175,309
Int. Cl.[3] A61M *7/00*
U.S. Cl. 128—260 8 Claims

1. An article for controllably dispensing drugs, comprising:

a. crystalline polyethylene having a melting point of at least

100° C. formed into a solid shape which has structural integrity; and

b. from about 0.5% to about 50% by weight based on said polyethylene of an addictive drug antagonist present in an antagonistically effective amount and substantially uniformly and intimately dispersed throughout portions of said shaped polyethylene with an outer surface of said solid shape comprising means for diffusing said drug antagonist therethrough with said drug antagonist exuding to said outer surface.

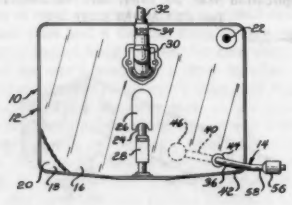


4,344,432

DEVICE FOR COLLECTING BODY FLUIDS

Edward F. Pankau, Park Ridge, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Jan. 7, 1981, Ser. No. 223,186
Int. Cl.³ A61F 5/44
U.S. Cl. 128—275 **18 Claims**



12. A device for collecting body fluids from a patient's body, comprising:

a receptacle having a chamber to receive said body fluids;

a conduit having a portion located in said chamber, said conduit having a lumen extending along the conduit, a diffusion opening communicating with said lumen, and an inflation opening communicating with said lumen;

a membrane secured to the conduit in said chamber and closing the diffusion opening, said membrane being slightly permeable to liquid; and

an inflatable balloon of elastic material secured to the conduit and defining a cavity communicating with the inflation opening.

4,344,433

OSTOMATES APPLIANCE

Francis C. Smith, Fort Worth, Tex., assignor to Smith's Ostomy Products, Inc., Fort Worth, Tex.

Filed Sep. 10, 1980, Ser. No. 186,144
Int. Cl.³ A61F 5/44
U.S. Cl. 128—283 **15 Claims**

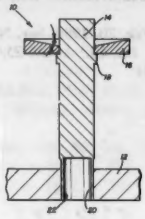
1. Apparatus for facilitating preassembly and attachment of a face plate and adhesive sealing ring around a stoma, comprising:

elongate post means having an open end and a closed end, the open end being adapted for receiving absorbent material;

the open end of said post means being dimensioned for placement in predetermined surrounding relationship over the stoma;

collar means mounted on said post means for supporting the face plate during attachment of the adhesive sealing ring thereto; and

base means for releasably supporting said post at either end thereof remotely from the stoma.

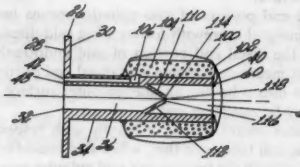


4,344,434

ILEOSTOMY APPLIANCE AND METHOD FOR IMPLANTING THE SAME

William G. Robertson, Santa Barbara, Calif., assignor to Santa Barbara Medical Foundation Clinic, Santa Barbara, Calif.

Filed Jun. 1, 1981, Ser. No. 268,879
Int. Cl.³ A61F 5/44
U.S. Cl. 128—283 **20 Claims**



1. An ileostomy appliance comprising

a support housing including an elongated central member having a predetermined axial length and which communicates with an attachment plate having opposed parallel surfaces, said support housing having an aperture extending axially therethrough forming a passageway which terminates in a first opening adjacent said attachment plate and a second opening which terminates at the remote end of the elongated central member;

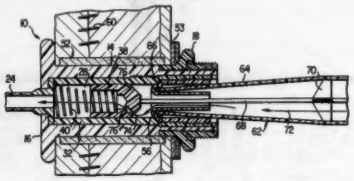
a preshaped collapsible member having a fluid tight, outer surface, two ends and an interior cavity, said preshaped collapsible member being positioned around said elongated central member with the ends of the preshaped, collapsible member in fluid tight sealing engagement with the exterior outer surface of said elongated central member with one end of the preshaped collapsible member being spaced a predetermined distance from the end of the elongated central member adjacent the attachment plate and the other end of which is adjacent the second opening of the elongated central member; and

means for withdrawing fluid from the interior cavity of said preshaped collapsible member to create a reduced pressure therein enabling ambient atmosphere pressure to collapse said collapsible member to reduce the geometrical dimension thereof and for enabling fluid to be drawn into the interior cavity of a deflated preshaped collapsible member at ambient atmospheric pressure to expand said preshaped collapsible member back to its original shape.

4,344,435
METHOD AND SURGICALLY IMPLANTABLE APPARATUS FOR PROVIDING FLUID COMMUNICATION WITH THE INTERIOR OF THE BODY

Norbert T. Aubin, P.O. Box 982, Loma Linda, Calif. 92324

Filed Dec. 15, 1978, Ser. No. 969,835
Int. Cl.[3] A61M *27/00*
U.S. Cl. 128—350 R 13 Claims



1. A surgically implantable apparatus for a gastronomy, comprising:

a hollow, generally cylindrical elongated body for insertion through a surgical opening in the abdominal wall and stomach wall of the patient, said cylindrical body having

a radially outwardly extending concentric flange for location at the interior side of the stomach wall to inhibit movement of the cylindrical body out of the patient; and

a concentric radially inwardly extending flange which narrows the bore of the cylindrical body;

means, attached around the circumferential surface of the cylindrical body, for facilitating fixation of the tissue of the abdominal wall to the cylindrical body;

a flange member, threaded concentrically on the cylindrical body for tightening against the external surface of the abdominal wall to inhibit movement of the cylindrical body into the patient and to permit adjustment of the apparatus for variations in thickness of the abdominal wall;

a flexible cannula for insertion in the gastrointestinal tract of the patient, said cannula having radially outwardly extending flange for engaging the inwardly extending flange of the cylindrical body;

a first threaded sleeve for engaging corresponding threads in the bore of the cylindrical body and for selectively securing the flange of the cannula in sealing engagement with the cylindrical body and alternatively, selectively releasing the flange of the cannula to permit the cannula to be withdrawn through the bore of the cylindrical body;

a valve seat;

a second threaded sleeve concentric with the cylindrical body for selectively securing the valve seat in position and alternatively, selectively releasing the valve seat from the cylindrical body; and

a valve body, moveable along the axis of the cylindrical body away from the valve seat responsive to the insertion into the apparatus of the couping of a extracorporeal conduit.

4,344,436
DEVICE FOR DETERMINING LOCATION OF THE TIP OF CATHETER

Yukio Kubota, No. 1-12, Uenohigashi 1-chome, Toyonaka-shi, Osaka-fu, Japan

Filed Oct. 23, 1980, Ser. No. 200,017
Claims priority, application Japan, Jan. 16, 1980, 55-5259[U]; Mar. 31, 1980, 55-42705
Int. Cl.[3] A61M *25/00*
U.S. Cl. 128—350 R 5 Claims

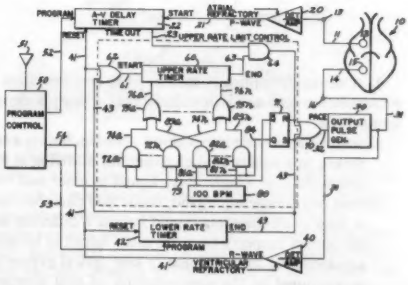
1. An apparatus for determining the location of the tip of a catheter in the bronchi, said apparatus comprising catheter tube means for insertion into the bronchi and for removing matter from the bronchi, said catheter tube means including a curved tip at one end thereof and guide mark means extending along the length of said catheter tube means on one side thereof for providing an indication of the direction of said curved tip; a sound signal generator means coupled to the other end of said catheter tube means for generating a sound signal in said cathe-

ter tube means such that the sound signal travels through said catheter tube means and exits from said one end thereof; and sound signal receiver means, external to the body, for receiving the sound signal exiting from said one end of said catheter tube means and thereby determining the position of said one end of said catheter tube means within the bronchi.

4,344,437
PACEMAKER TRIGGERING COUPLING CIRCUIT

H. Toby Markowitz, Anoka, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 30, 1980, Ser. No. 145,051
Int. Cl.[3] A61N *1/30*
U.S. Cl. 128—419 PG 7 Claims



1. A heart pacemaker having atrial synchronous and minimum rate ventricular pacing modes and including means for preventing closely coupled ventricular stimulation pulses, comprising:

atrial terminal means and ventricular terminal means for connection, respectively, to the atrium and ventricle of a patient's heart;

output pulse generating means for selectively delivering ventricular electrical stimulation pulses to said ventricular terminal means;

ventricular sense amplifier means connected to said ventricular terminal means for sensing ventricular beats of the heart and for producing a corresponding ventricular signal;

atrial sense amplifier means connected to said atrial terminal means for sensing atrial contractions of the heart and for producing a corresponding atrial signal;

control means connected to receive said atrial and ventricular signals and connected to control said output pulse generating means, said control means for causing delivery of delayed synchronized ventricular stimulation pulses in response to atrial signals occurring faster than a predetermined minimum rate, and for causing delivery of ventricular stimulation pulses to maintain the ventricular rate at the predetermined minimum rate in the absence of atrial signals above the minimum rate; and

said control means including means for preventing delivery of a ventricular stimulation pulse at a pacing rate in excess of a predetermined maximum rate limit with respect to a proceding spontaneous or stimulated ventricular contraction, and further including means for increasing said predetermined maximum rate limit during atrial synchronous pacing and reducing to a lower maximum rate limit when pacing at said predetermined minimum pacing rate.

4,344,438

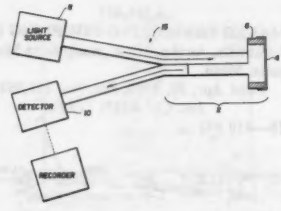
OPTICAL SENSOR OF PLASMA CONSTITUENTS

Jerome S. Schultz, Ann Arbor, Mich., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Continuation-in-part of Ser. No. 930,659, Aug. 2, 1978, abandoned. This application Apr. 28, 1980, Ser. No. 144,043

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—634 **14 Claims**



1. A device to optically measure the concentration of low molecular weight assay ligand, such as a plasma constituent, comprising:

a chamber insertable into a blood vessel including a selection means, in a wall of said chamber, for allowing at least one low molecular weight assay ligand to enter said chamber;

at least one competing ligand, inside said chamber, each said at least one competing ligand having a different identifiable optical property from the assay ligand to be measured, a quantitative measurement of said optical property being proportional to the concentration of said competing ligand, each said at least one competing ligand being a material which will not pass through said selection means;

at least one binding means having binding sites, confined inside said chamber in a selected region, for reversibly binding with the low molecular weight assay ligand to form a first complex of the binding means and assay ligand, and for reversibly binding with said competing ligand to form a second complex of the binding means and competing ligand, said competing ligand competing with the assay ligand for binding sites on said binding means;

a light source means in optical contact with the interior of said chamber for illuminating the unbound competing ligand and/or the second complex within said chamber; and

a detecting means in optical contact with said chamber for quantitatively measuring the indentifiable optical property of substantially only the unbound competing ligand or of substantially only the second complex.

4,344,439

CATHETER FOR USE IN LOCALIZING THE ORIGIN OF IDIOPATHIC MICROSCOPIC HEMATURIA

Ulrico Jacobellis, Via Andrea Da Bari 128, 70121 Bari, Italy

Filed Oct. 20, 1980, Ser. No. 198,711

Int. Cl.³ A61M *25/00;* **A61B** *10/00*

U.S. Cl. 128—636 **4 Claims**

1. For use with a conventional cystoscope a ureteral catheter comprising an elongated tubular member having an insertion tip, said tip having opening means therein and including means therein for detecting the presence of blood or hemoglobin in the urine from one of the ureters or kidney at the mouth of the ureters into the bladder upon insertion of the tip into the bladder, said catheter being sized for coaxial insertion through the cystoscope said detecting means comprising a color reactive agent material mounted adjacent said opening means within said tip.

4,344,440

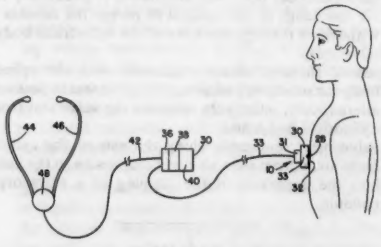
MICROPROBE FOR MONITORING BIOPHYSICAL PHENOMENA ASSOCIATED WITH CARDIAC AND NEURAL ACTIVITY

Trygve Anby, 312 S. Hayford St., Lansing, Mich. 48910, and Barnett Rosenberg, 2687 Ramparte Path, Holt, Mich. 48824

Filed Apr. 1, 1980, Ser. No. 136,317

Int. Cl.³ A61B *5/04*

U.S. Cl. 128—653 **28 Claims**



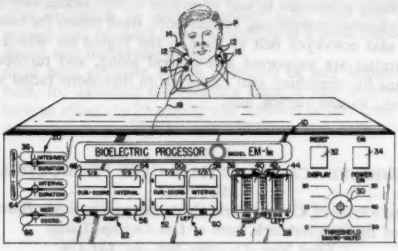
14. A microwave diagnostic instrument for monitoring biophysical activity associated with cardiac and neural activity of a life system comprising a casing, a source of low power microwaves within said casing, means within said casing and coupled to said source for concentrating and directing the radiation into a localized beam of radiation from said source through an exit opening provided in said casing, detecting means disposed at said opening for detecting modulated backscattered radiation from the life system of interest and means connected to said detecting means for developing a signal modulated in accordance with the detected modulated backscattered radiation.

4,344,441

MANDIBULAR ELECTROMYOGRAPH

John C. Radke, Seattle, Wash., assignor to Myo-Tronics Research, Inc., Seattle, Wash.

Filed Jul. 3, 1980, Ser. No. 165,794
Int. Cl.³ A61B 5/04
U.S. Cl. 128—733 20 Claims



1. An electromyograph having a plurality of electrode channels receiving input signals from respective electrodes, each positioned to receive an electrical signal from a masticatory muscle, comprising:

threshold means for each electrode receiving respective input signals from said electrodes and generating respective actuating signals when the amplitude of said input signals exceeds a predetermined value;

first detector means receiving all of said actuating signals and generating an enabling signal for each electrode channel responsive to an actuating signal from any of said threshold means;

respective second detector means for each electrode channel, said second detector means terminating the enabling signal for said channel responsive to an actuating signal from the corresponding threshold means;

timer means for each electrode channel, said timer means recording the duration of the enabling signal for the corresponding electrode channel; and

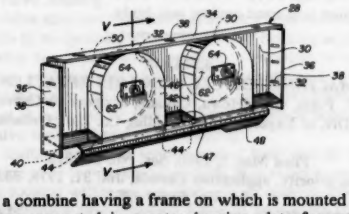
display means for each electrode channel receiving an output from the corresponding timer means indicative of the duration of the enabling signal for the corresponding electrode channel whereby said display means indicate the time elapsing between contraction of the first-to-contract masticatory muscle and the contraction of each of the remaining masticatory muscles.

4,344,442

ANTI-WRAP APPARATUS

Peter J. Torland, New Holland, and Robert R. Todd, Leola, both of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Apr. 24, 1981, Ser. No. 257,025
Int. Cl.³ A01F 7/06, 7/00
U.S. Cl. 130—27 T 9 Claims



1. In a combine having a frame on which is mounted at least one rotor supported in a rotor bearing plate for rotational movement about an axis of rotation, said rotor having a cylindrical axially aligned outer wall terminating at a first end adjacent said rotor bearing plate, crop conveying elements attached to said outer wall for conveying crop material away from said first end, and a shaft forming said axis of rotation and projecting outwardly from said first end for supporting said rotor within said rotor bearing plate, said outer wall of said rotor having a first diameter, an improved rotor bearing plate assembly comprising:

a first planar portion extending generally transverse to said axis of rotation;

means for connecting said first planar portion to said frame;

a recessed portion formed in said first planar portion to correspond to each said rotor, said recessed portion having an arcuate side wall affixed to said first planar portion and positioned in axial alignment with said axis of rotation of said rotor so as to have a second diameter slightly larger than said first diameter of said rotor outer wall, said recessed portion further having an end wall affixed to said arcuate side wall and positioned generally parallel to said first planar portion at a spaced relationship thereto;

a shaft support mounted in said end wall of said recessed portion; and

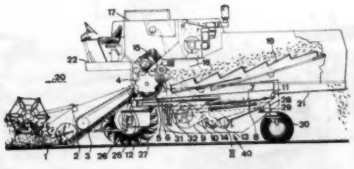
a bearing mounted in said shaft support in said end wall for rotatably supporting said rotor shaft such that said rotor outer wall extends into said recessed portion with said first end of said rotor being positioned between said first planar portion and said end wall.

4,344,443

CLEANING APPARATUS OF COMBINE HARVESTERS

Cyriel R. J. De Busscher, Sijsele-Damme; Walter V. Deleu, Torhout, and Francois Van Herpe, Houtem, all of Belgium, assignors to Sperry Corporation, New Holland, Pa.

Filed Jul. 1, 1980, Ser. No. 165,161
Claims priority, application United Kingdom, Jul. 4, 1979, 7923326
Int. Cl.³ A01F 12/24
U.S. Cl. 130—272 10 Claims



1. In a combine harvester:

threshing, separating and cleaning devices operably mounted in said harvester, said cleaning device having a grain pan, a cleaning sieve and a cleaning fan; and

means for leveling said cleaning device to a transverse generally horizontal position in response to said harvester being inclined relative to the horizontal, said means for leveling including said grain pan, sieve and cleaning fan of said cleaning device being pivotable in unison about an axis extending in the direction of travel of said harvester, said cleaning device being connected to a subframe pivotally mounted in said harvester.

4,344,444

CIGARETTE HOLDER WITH NICOTINE EXTRACTOR

Noriyoshi Miura, 1-5, Takashimadaira 4-chome, Itabashi-ku, Tokyo, Japan 175

Filed Nov. 13, 1980, Ser. No. 206,361
Claims priority, application Japan, Nov. 28, 1979, 54/164399
Int. Cl.³ A24F 13/06
U.S. Cl. 131—201 3 Claims

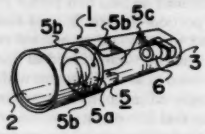
1. A cigarette holder comprising:

(a) a hollow cylindrical body made of transparent synthetic resin having a cigarette insertion opening at one end with a mouth section at the other end, said body being tapered

at least in said mouth section, a central section in said body;

(b) a flue (4) extending in said body from said central section towards said mouth section, said flue having a step section towards said one end;

(c) a nicotine extractor (5) made of a colored synthetic resin in said flue (4) said nicotine extractor having a disc portion



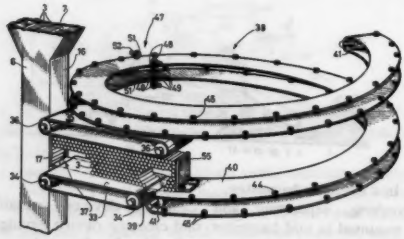
disposed to engage said step section and an elongated body portion extending toward said mouth section with a small gap between said body portion and said hollow cylindrical body inner wall, said extractor having a plurality of apertures of small size in at least one of said portions whereby smoke flowing out of said small apertures collides with the inner surface of said flue and the nicotine and tar attach to said flue inner surface.

4,344,445

APPARATUS FOR DIRECTLY LINKING ONE OR MORE CIGARETTE MAKING MACHINES TO ONE OR MORE CIGARETTE PACKING MACHINES

Enzo Seragnoli, Bologna, Italy, assignor to G. D Societa per Azioni, Bologna, Italy

Filed Nov. 24, 1980, Ser. No. 210,043
Claims priority, application Italy, Dec. 11, 1979, 3566 A/79
Int. Cl.³ A24C *5/35*
U.S. Cl. 131—282 **5 Claims**



1. Apparatus including at least one cigarette making machine and at least one cigarette packing machine, and means for directly linking said at least one cigarette making machine to said at least one cigarette packing machine comprising: at least one line for transferring a mass of cigarettes from said at least one making machine to said at least one packing machine, means to place cigarettes horizontally and parallel one with the other on said transferline and to move said cigarettes in a direction crosswise to their axes; said direct linking means comprising at least one storage chamber to compensate for production imbalances between said machines, said direct linking means comprising a channel that runs into said line and comprising a conveyor, running along the full path thereof on which the cigarettes are supported and carried along, and comprising a wall, integral with and substantially vertical with respect to said conveyor, that is movable between two positions of extremity of said storage chamber corresponding to conditions in which said storage chamber is completely full and one in which it is completely empty, respectively; a reversible motor means driving the said conveyor longitudinally to and fro in two directions opposite one another, essential features of said apparatus including that said direct linking means is formed with a constant radius of curvature around a vertical axis, said conveyor being constituted by a continuous endless belt mounted on truncated cone shape rollers placed in the region of the extremities of said storage chamber, said cone shaped rollers being mounted on axes that pass through said vertical axis, at least one of said cone shaped rollers being drivingly connected to said reversible motor means, said storage chamber comprising, furthermore, fixed means for sustaining said conveyor belt at least in the region on which the cigarettes are supported and carried along, and turnbuckle means for stretching said conveyor in directions radial with respect to said vertical axis.

4,344,446

COMBINED SCALP AND HAIR CARE PRODUCTS AND METHOD

Horst Ehrhardt, Canoga Park, Calif., assignor to Susan Bjurman and Barbara Babcock, both of Los Angeles, Calif.

Filed Mar. 17, 1980, Ser. No. 131,274
Int. Cl.³ A45D *7/00*
U.S. Cl. 132—7 **4 Claims**

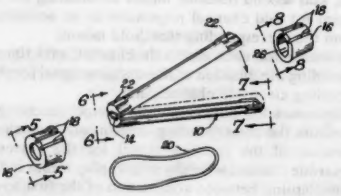
2. A solid waxy stick-like scalp cleanser comprising alkali metal fatty acid soap, amphoteric detergent, antimicrobial agent and emulsifier in a substantially anhydrous humectant solvent.

4,344,447

DOUBLE TWIST HAIR ROLLER

Willie L. Morrow, 4167 Market St., San Diego, Calif. 92102

Filed Dec. 23, 1980, Ser. No. 219,848
Int. Cl.³ A45D *2/14*
U.S. Cl. 132—42 R **5 Claims**



1. A hair curler comprising:

(a) an elongated body;

(b) an elastic band extendable to the substantial length of said body;

(c) end caps engageable on the ends of said body to stretch said band therebetween; and

(d) the ends of said body being polygonal and the inside of said end caps being polygonal to mate with the ends of said body such that said end caps can be removed from said body and twisted to define a helical curve in said band around said body and be locked in said twisted position to tighten said band against said body.

4,344,448

MACHINE FOR CLEANING RECEPTACLES

Roger F. Potts, Georgetown, Canada, assignor to Convey Systems Div. of Export Tool & Welding Co. Ltd., Ontario, Canada

Filed May 7, 1980, Ser. No. 147,622
Claims priority, application Canada, Jul. 31, 1979, 332924
Int. Cl.³ B08B *3/02*
U.S. Cl. 134—73 **23 Claims**

1. An apparatus for cleaning dirty objects with a cleaning solution comprising:

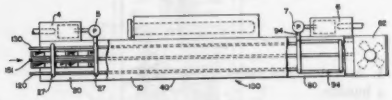
an immersion bath filled with cleaning fluid so that dirty

objects passing through said immersion bath are completely immersed in the cleaning fluid;

first high pressure means, mounted adjacent to said immersion bath, for spraying cleaning fluid on the dirty objects before operation by said immersion bath;

second high pressure means, mounted adjacent to said immersion bath, for spraying rinse fluid on the dirty objects after operation by said immersion tank, said first and second high pressure means extending in a plane disposed above said immersion bath;

a third high pressure means, mounted in said immersion bath, for agitating the cleaning fluid in said immersion bath to effect the loosening and removal of dirt from the dirty objects passing through said immersion bath;



means for moving the dirty objects serially through said first high pressure means, said immersion bath and said second high pressure means;

means for heating the cleaning fluid in said immersion bath at an elevated temperature and for maintaining the cleaning fluid at said elevated temperature; and

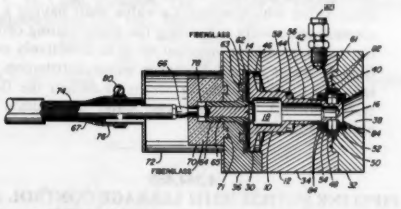
moving means, extending between said first high pressure spraying means and said second high pressure spraying means, for guiding the dirty objects along a bypass path whereby lightly soiled objects are directed along said bypass path to bypass the cleaning operation in said immersion bath.

4,344,449

FAST-ACTING VALVE AND USES THEREOF

James A. Meyer, Espanola, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 16, 1980, Ser. No. 150,393
Int. Cl.³ F16K *31/06, 21/06*
U.S. Cl. 137—1 **15 Claims**



1. A valve comprising:

a. a valve housing;

b. a valve stem having a coil end and a muzzle end and being able to reciprocate within said valve housing so that said valve has a fully open position, a plurality of partially open positions, and a fully closed position, said valve stem having a size and shape relative to said valve housing such that at least one air cushion space is formed between said valve stem and said valve housing;

c. a sealing means for sealing said at least one air cushion space so as to provide an air-tight fit in order to pressurize air located within said at least one air cushion space, thus providing a first restoring force to help close the valve and thus protecting said valve from destruction; and

d. a gas reservoir located within said valve housing, said gas reservoir being in open communication with a space exterior to said valve when said valve is in an open position and being sealed off from said space exterior to said valve when said valve is in its fully closed position,

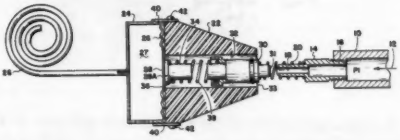
wherein said valve stem has x consecutively numbered portions, each portion of which has a particular largest diameter and x being an integer greater than 3, wherein said first portion has a surface corresponding to said muzzle end which is exposed to said space exterior to said valve, wherein said xth portion has a surface corresponding to said coil end which is exposed to an actuating means, wherein said first portion has a largest diameter a, wherein said second portion has a largest diameter b, wherein said third portion has a largest diameter c, wherein c is greater than a, and wherein a is greater than b, so that when said valve is in its fully open position or a partially open position, gas is released from said gas reservoir to said space exterior to said valve so as to exert a larger force in the axial direction on said third portion than on said first portion, thus providing a second restoring force tending to restore said valve to its closed position.

4,344,450

ICING PREVENTOR

William R. Walters, 910 W. Caddo, Cleveland, Okla. 74020

Filed Apr. 8, 1980, Ser. No. 138,584
Int. Cl.³ E03B *7/12*
U.S. Cl. 137—62 **3 Claims**



1. Apparatus for connection to an outdoor water line carrying water at a selected pressure, for producing a selected low flow rate of water from said water line, when the outdoor temperature drops below a selected temperature, comprising:

(a) a single orifice of selected small diameter in the end of said water line;

(b) body means comprising a closed chamber and a housing for a valve closure means, said closed chamber means having an expansible portion, said chamber means filled with a selected condensible gas for which the vapor pressure varies with temperature in a known manner;

(c) said closure means being positioned adjacent said single orifice, a portion of said closure means extending beyond and exteriorly of the housing in all positions of said closure means;

(d) means connecting said expansible portion of said chamber means to said closure means;

(e) said means connecting said expansible portion of said chamber to said closure means including series compliant means; and

(f) helical spring means being positioned between said closure means and said orifice, said helical spring means surrounding said orifice and said exterior portion of said closure means;

whereby when the outdoor temperature is above a selected value, said expansible portion will move outwardly to press said exterior portion of said closure means against said orifice, to close off said flow; and

when the outdoor temperature is below said selected value said expansible portion will move inwardly away from said exterior portion of said closure means permitting water flow through said orifice.

4,344,451

PRESSURE RESPONSIVE DISTRIBUTING VALVE DEVICE

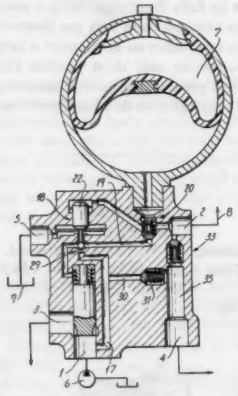
Lüdwig Büdecker, Frankfurt am Main, and Bernd Schütt, Oberursel, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jul. 17, 1980, Ser. No. 169,555

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1979, 2935949

Int. Cl.³ G05D *15/00*

U.S. Cl. 137—101 2 Claims



1. A valve device comprising:

a pressure port connected to a pump;

a first user port in communication with a pressure accumulator and a first user component, said first user port being connectible to said pressure port through a conduit having a throttle and a first check valve disposed therein;

a second user port in communication with a second user component and connectible with said pressure port through a by-pass valve including a by-pass piston having a first effective surface adjacent said pressure port adapted to be subjected to pressure at said pressure port in the opening direction of said by-pass valve and a second effective surface spaced from said first effective surface adapted to be subjected to pressure from said pressure port in the closing direction of said by-pass valve, said second effective surface being disposed in a control chamber, said control chamber being connected to said pressure port through said throttle and an accumulator-pressure-responsive pilot valve when the pressure of said accumulator is below a predetermined limit and to a return line when the pressure of said accumulator reaches said predetermined limit; and

a third user port in communication with a third user component requiring a large amount of pressure transmitting fluid on demand only and connectible with said pressure port through a control valve whose valve passageway is open when said third user component demands fluid, said control valve being a second check valve disposed in a first channel connecting said first user port to said third user port, said second check valve being opened by pressure at said first user port when said third user component is operated and pressure in said first channel decreases.

4,344,452

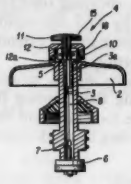
WATER FEED VALVE WITH SPRINKLING HOLES

Matsuo Sato, No. 3-47, Nishinagasu-Higashidori, Amagasaki, Japan

Filed Mar. 5, 1981, Ser. No. 240,944

Int. Cl.³ F16K *51/00*

U.S. Cl. 137—238 2 Claims



1. A water feed valve comprising:

a handle;

a valve operating shaft having a water passage formed therein along the longitudinal axis of the valve operating shaft and a flow-in hole formed at the lower side of said operating shaft so as to be communicated with a side of a water supply passage, said water passage being opened at approximately the central portion of a top surface of said handle which is mounted at the upper portion of the valve operating shaft; and

a water sprinkling member mounted to said opened portion to thereby form water streams on the upper surface of the handle from said water sprinkling member at the same time the supply water is started by operation of said water feed valve wherein said water sprinkling member is provided with a water exiting orifice communicated with said water passage of said operating shaft and also formed with a plurality of water discharge distribution holes at the upper peripheral surface thereof, wherein said water sprinkling member further comprises a water discharge distribution pipe having said plurality of discharge water distribution holes formed at a junction with respect to the operating shaft and the peripheral surface thereof and located concentrically surrounding said valve operating shaft and overlying said handle, and a cap member for blocking the top portion of said distribution pipe and wherein said cap member comprises a cap with an open/-close valve which includes a valve shaft having a valve element selectively contacting the water exiting orifice of the water sprinkling member so as to selectively control flow of water to said discharge water distribution holes, said cap further including means to deflect the flow of water through said discharge water distribution holes onto said handle.

4,344,453

PIPELINE SWITCH WITH LEAKAGE CONTROL AND CLEANABLE LEAKAGE CAVITY

Otto A. P. Tuchenhagen, Büchen; Hans O. E. Mieth, Hamburg, and Herbert R. Coüra, Büchen, all of Fed. Rep. of Germany, assignors to Otto Tuchenhagen GmbH & Co. KG, Buchen, Fed. Rep. of Germany

Filed Jan. 27, 1978, Ser. No. 873,068

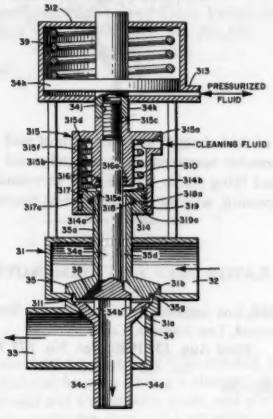
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1977, 2703792; Nov. 14, 1977, 2750833

Int. Cl.³ F16K *1/44*

U.S. Cl. 137—240 6 Claims

1. Apparatus for cleaning a liquid connection and securing a stroke and spring abutment for double seat pipeline switches with leakage control, comprising a pipeline switch housing, a pipeline switch drive mounted within said switch housing, two valve disks of different sizes, two concentrically mounted valve rods of different lengths, one of said valve rods being hollow, the one of longer length fitting within the other of

shorter length, said inside valve rod connected to said pipeline switch drive and the smaller of the two valve disks and defining a discharge bore leading to the atmosphere, said inside valve rod upon being lifted by said drive carrying along said valve disk of larger size, said valve disks in both the closed position and the open position enclosing between themselves a leakage cavity which is connected via openings with said discharge bore, a pressing and guide part fitting over an end of the hollow valve rod, a housing surrounding a portion of the



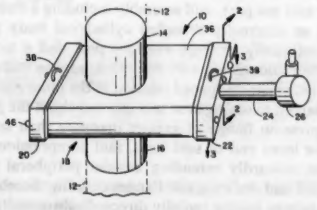
longer valve rod and defining an upper spring abutment, an upper stop surface for said pressure and guide part and a connecting opening adapted to receive a cleaning fluid, said housing and said pressing and guide part together forming a spring chamber and a spring within said spring chamber tightly closed off from the atmosphere, said spring chamber communicating through said leakage chamber with said discharge bore to provide a fluid passageway for said cleaning fluid through said apparatus.

4,344,454

VALVE BONNET FOR HIGH TEMPERATURE SERVICE

John C. H. Chan, Houston, Tex., assignor to Houston Systems Manufacturing Co., Inc., Houston, Tex.

Filed Jun. 1, 1981, Ser. No. 268,824
Int. Cl.³ F16K *43/00*
U.S. Cl. 137—315 **7 Claims**



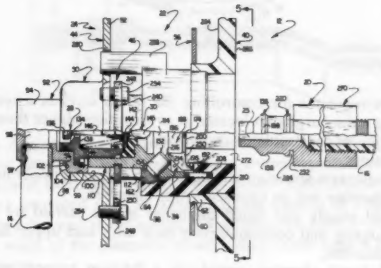
1. A bonnet connection on the body of a valve used to control the flow of hot fluids comprising: a lateral opening through the body wall connecting with the valve bore; a laterally extended portion of the body wall formed around the lateral opening; the opening being sufficient to allow for the removable installation of valve seat means and valve closure means within the valve bore; a valve bonnet comprising a substantially rigid end portion and a substantially flexible flange formed to be positioned relative to the laterally extended portion of the valve body so as to allow for proper operation of the valve closure means; the flange depending from the end portion and extending around and adjacent to the laterally extended portion of the body wall such that the laterally extended portion of the body wall may be attached to the flange by welding so as to seal between the bonnet and the body and retain the bonnet with the body for proper operation of the valve, the flange being substantially thinner than the extended portion of the body wall and a space being defined between the flange and the body wall such that substantial differential thermal expansion of the body wall may occur without causing substantial movement of the end portion.

4,344,455

COUPLING ASSEMBLY

James F. Norton, Berea; Richard J. Silagy, Parma, and Walter W. Antoniw, Lakewood, all of Ohio, assignors to Tuthill Corporation, Cleveland, Ohio

Filed Aug. 18, 1980, Ser. No. 178,866
Int. Cl.³ F16K *43/00*; F16L *37/28*
U.S. Cl. 137—329.4 **67 Claims**



1. A coupling assembly for use in connecting a pair of conduits in fluid communication, said coupling assembly comprising a plug adapted to be connected with one of the conduits, said plug having a central axis which extends along a fluid flow path through said plug, and socket means adapted to be connected with the other conduit and adapted to telescopically receive said plug, said plug being axially movable from a disengaged position spaced from said socket means to a storage position in which said plug is supported by said socket means and is telescopically disposed in said socket means to a first extent and being axially movable from the storage position to an engaged position in which said plug is telescopically disposed in said socket means to a second extent which is greater than the first extent and in which the conduits are connected in fluid communication through said plug and said socket means, said socket means including locking means which is operable between a locking condition holding said plug against axial movement from the engaged position toward the storage position and a release condition in which said locking means is ineffective to hold said plug against axial movement, said locking means including a circular array of locking elements and retainer means for holding said locking elements in engagement with said plug when said locking means is in the locking condition and said plug is in the engaged position with a holding action which is sufficient to prevent said plug from being manually moved from the engaged position to the storage position, said retainer means being ineffective to hold said locking elements in engagement with said plug when said locking means is in the release condition to enable said plug to be moved from the engaged position to the storage position, said socket means further including gripper means for holding said plug against axial movement from the storage position to the disengaged position with a gripping action which can be overcome by manually pulling said plug away from said socket means, said gripper means including a circular array of detents

which is disposed in a coaxial relationship with said circular array of locking elements and is spaced from said circular array of locking elements when said locking means is in the engaged condition.

4,344,456

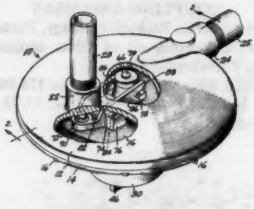
PRESSURE RESPONSIVE LIQUID FLOW REGULATOR

Eldon Hostetler, 15110 County Rd. 20, Middlebury, Ind. 46540

Filed Sep. 26, 1977, Ser. No. 836,387

Int. Cl.³ F16K *21/18*

U.S. Cl. 137—403 **1 Claim**



1. A regulator for controlling the liquid level in a system having a discharge part located at an elevation higher than the elevation of the regulator comprising

a housing,

a diaphragm spanning said housing to define an upper liquid chamber and an opposed lower chamber,

liquid supply and liquid discharge means carried by said housing and communicating only with said upper liquid chamber,

said liquid chamber containing a fulcrum support and a valve seat associated with said supply means and spaced from said fulcrum support,

adjustable spring means in said opposed chamber bearing on said diaphragm,

a lever fulcrumed on said support in said liquid chamber having one end connected to and responsive to variations in the position of said diaphragm incident to changes of the weight of liquid acting on said diaphragm, and

a valve element carried by the opposite end of said lever and adapted in one position of said lever to abut said valve seat and seal said water supply means,

said diaphragm mounting a lever-actuating stem including a rotatable collar having laterally projecting lever abutment means, said lever including a bifurcated end portion fitting freely around said collar and slotted to receive said projecting lever abutment means with slight clearance.

4,344,457

TAP AND MIXER FOR THE DELIVERY OF WATER

Celso Caroli, Via Sardegna, 16, Savignano sul Panaro (Modena), Italy

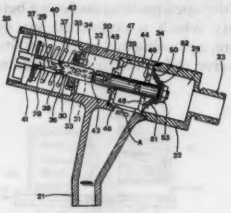
Filed Apr. 18, 1980, Ser. No. 141,677

Claims priority, application Italy, Apr. 19, 1980, 28948/79[U]; Apr. 19, 1980, 28949/79[U]; Apr. 19, 1980, 40051 A/79

Int. Cl.³ F16K *13/00*

U.S. Cl. 137—597 **15 Claims**

1. In a mixing tap for the delivery of water in sanitary plants, of the type having an outflow opening in a wall thereof and operated by at least one push-button and including at least one water-tight shutter, an end of which is fastened to a shaft which slides in aligned bore holes drilled into support diaphragms inside the body of the tap and controlled by application of an adequate pressure on the push-button in order to obtain opening of the shutter against action of a spring, the improvement wherein said shutter consists of a strip of elastic metallic material lined with rubber or plastic material, wound up to form a spiral having a plurality of turns and with continuous partial covering of the width of the strip, that turn of said spiral having the smallest diameter being fastened at its end to



said shaft of said shutter, and that turn of said spiral with the largest diameter surrounding completely said water outflow opening and lying freely on the wall surrounding said water outflow opening, without being attached thereto.

4,344,458

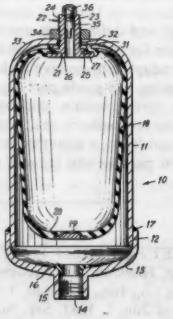
ACCUMULATOR DEVICE WITH IMPROVED BLADDER SEAL

Abduz Zahid, Los Angeles, Calif., assignor to Greer Hydraulics, Incorporated, Los Angeles, Calif.

Filed Aug. 13, 1980, Ser. No. 177,795

Int. Cl.³ F16L *55/04*

U.S. Cl. 138—30 **2 Claims**



1. An accumulator device comprising a pressure vessel having end portions, said vessel including a gas charging port at one end and an oil port at the other end, a bladder assembly mounted in said gas port, said assembly including a stem member having an externally threaded cylindrical body portion extending outwardly through said gas port and a mounting portion within said vessel, said mounting portion including a stop flange in proximate spaced relation to the inner end of said stem and adapted to seal against said one end about the gas port and a compression flange of greater diameter than said stop flange at the inner end of said stem, said compression flange including an upwardly extending annular peripheral rim directed toward said one end, said flanges defining therebetween an annular groove having radially directed substantially parallel upper and lower walls, an elastomeric bladder member including an annular lip extending into, completely filling, and bonded to said groove, said bladder member including an upwardly projecting integral annular bead portion which, in the unstressed condition of said bladder member, projects above said stop flange, the outer diameter of said bead portion being greater than that of said stop flange and less than the diameter of said rim, and a jam nut mounted on said threaded portion of said stem and reacting against the outer wall por-

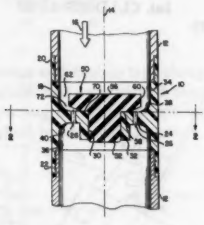
tions of said vessel surrounding said gas port, said nut clampingly compressing said bead portion into conforming alignment with the inner walls of said vessel surrounding said stop flange and extruding increments of said elastomeric bladder member radially inwardly into said groove increasing the density therein.

4,344,459

FLOW CONTROL DEVICE EMPLOYING ELASTOMERIC ELEMENT

Walter R. Nelson, 7914 Grand Ave., Yucca Valley, Calif. 92284

Filed Nov. 3, 1980, Ser. No. 203,456
Int. Cl.³ F15D 1/02
U.S. Cl. 138—45 9 Claims



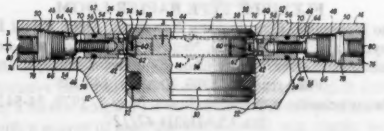
1. A flow control device for a fluid flow conduit, said device including a cylindrical housing having a chamber defined by a cylindrical side wall and a transverse plate, said plate having a flat surface facing said chamber and a plurality of flow passages arranged in a circle; and an elastomeric element having a circular flange disposed within said chamber, said flange having a seat engaging the flat surface of said plate and a beveled surface in confronting relationship with the flat surface of said plate and being progressively spaced apart therefrom, said beveled surface overlying said flow passages, said beveled surface and said plate defining between them a variable flow area, said plate including a central opening and said elastomeric element being generally T-shaped and including a stem received by said opening, said flange projecting from said stem.

4,344,460

APPARATUS FOR PLUGGING A PRESSURE PIPING SYSTEM

Imre Galos, Downers Grove, Ill., assignor to Advance Valve Installations, Hinsdale, Ill.

Filed Nov. 28, 1980, Ser. No. 211,423
Int. Cl.³ F16L 55/10
U.S. Cl. 138—89 23 Claims



1. Apparatus for securing a plug within a pressurized piping system comprising:

a segment for holding a plug in position in said piping system;

a segment engaging element coupled to said segment and slidably mounted in said piping system for engaging and locking said segment in position relative to said piping system; and

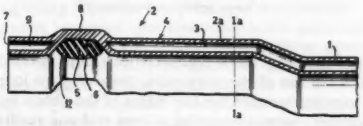
an actuating member having threads formed thereon threadedly mounted in said piping system for slidingly actuating said segment engaging member for moving said segment into and out of engagement with said plug, said actuating member having a first set of threads engaging said piping system and a second set of threads engaging said segment engaging element, said first and second sets of threads being threaded in opposite directions and cooperating to move said segment engaging element a distance greater than the distance moved by the actuating member upon rotation thereof.

4,344,461

PIPE PART WITH SOCKET PROVIDED WITH LONGITUDINALLY EXTENDING CHANNELS

Joannes H. Beune, Hardenberg, and Roelof H. Marissen, Bergentheim, both of Netherlands, assignors to Wavin B.V., Em Zwolle, Netherlands

Filed Dec. 28, 1979, Ser. No. 108,049
Claims priority, application Netherlands, Jan. 9, 1979, 7900172
Int. Cl.³ F16L 9/18, 21/02, 47/06
U.S. Cl. 138—109 15 Claims



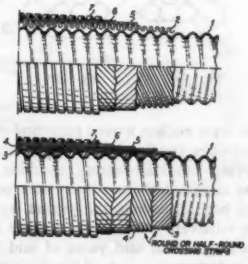
1. A pipe part comprising a socket, the wall of said pipe part being provided with longitudinally extending channels, said channels extending into the wall of the socket, said socket being provided with an annular recess located at a distance from a free end of the socket and obtained by radially pressing the walls of the channels towards each other over a certain distance.

4,344,462

FLEXIBLE TUBULAR CONDUIT

Jean-Paul Aubert, Puteaux, and Maurice Genini, Creteil, both of France, assignors to COFLEXIP, Puteaux, France

Filed May 23, 1980, Ser. No. 152,555
Claims priority, application France, May 30, 1979, 79 13814
Int. Cl.³ F16L 9/04, 9/18
U.S. Cl. 138—130 8 Claims



1. A flexible tubular conduit comprising an internal metallic undulating tube and an external metallic protection covering of interlocked strip, characterized by the fact that around said undulating tube is an interior covering of at least one metallic layer to provide resistance to bursting, and a sheath resistant to traction and to the effect of internal head pressure, said sheathing comprising at least two crossing superposed layers of metallic strips wound with opposite pitch, respectively.

4,344,463

RIBBON-TYPE FABRIC AND METHOD OF MAKING

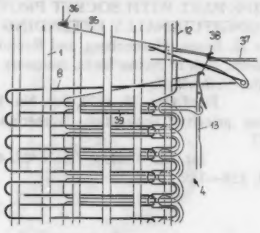
Jakob Müller, Stansstad, and Ferdinand Diesner, Murg-Hänner, both of Fed. Rep. of Germany, assignors to Textilma AG, Hergiswil, Switzerland

Filed Nov. 21, 1979, Ser. No. 98,142

Claims priority, application Switzerland, Dec. 5, 1978, 12400/78

Int. Cl.³ D03D 5/00

U.S. Cl. 139—383 R 37 Claims



1. A ribbon type fabric with weft-yarn loops inserted at both sides of the run of the warp yarn, the weft-yarn loops being held together between the two edges of the ribbon by at least one auxiliary yarn, comprising at least said one auxiliary yarn running parallel to the weft yarn loops over at least part of the width of the ribbon type fabric, and being tied off with itself, the weft-yarn loops of one side of the fabric being drawn through the respective weft-yarn loops of the other side of the fabric by respective auxiliary-yarn loops.

4,344,464

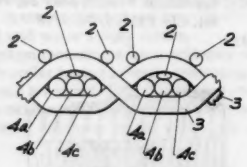
ENDLESS FORMING FABRICS WITH BI-CRIMP CHARACTERISTICS

Charles E. Thompson, Guilderland, and Samuel H. Herring, Rensselaer, both of N.Y., assignors to Huyck Corporation, Wake Forest, N.C.

Filed Jul. 11, 1980, Ser. No. 168,942

Int. Cl.³ D21F 1/10; D03D 15/00

U.S. Cl. 139—383 A 6 Claims



1. A double layer endless woven papermaking fabric having two functional sides, the first layer comprising a sheet surface structure having non-load-bearing machine direction and cross-machine direction yarns woven with substantially uniform crimp in both directions, the second layer of the fabric comprising a relatively coarse wear surface fabric structure having yarns larger than said yarns of said first layer, said larger yarns including woven load-bearing machine direction yarns and cross-machine direction yarns, said non-load-bearing machine direction yarns of said sheet surface fabric structure having elongation greater than the elongation of the machine direction yarns in the wear surface fabric structure, the two structures being joined together by interlacing the cross-machine direction yarns of the wear surface fabric structure with the machine yarns of the sheet surface fabric structure, whereby to provide a double layer fabric characterized by a sheet side exhibiting bi-crimp characteristics and a machine side exhibiting enhanced wear characteristics and stretch resistance.

4,344,465

METHOD AND APPARATUS FOR JETTING AUXILIARY FLUID IN JET LOOM

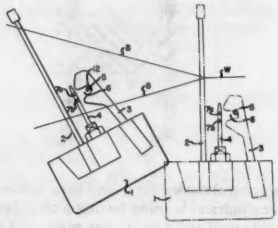
Junzo Hasegawa, Oobu; Susumu Kawabata, Aichi; Kazunori Yoshida, Nagoya; Fuzio Suzuki, Toyota; Yusuke Itoh, Oobu; Hajime Suzuki, Anjo; Hiroshi Arakawa, Kariya, and Akira Kobayashi, Oobu, all of Japan, assignors to K.K. Toyoda Jidoshokki Seisakusho and K.K. Toyota Chuo Kenkyusho, both of Aichi, Japan

Filed Sep. 12, 1979, Ser. No. 74,755

Claims priority, application Japan, Sep. 15, 1978, 53-127290[U]

Int. Cl.³ D03D 47/30

U.S. Cl. 139—435 7 Claims



1. In a jet loom comprising a transverse fluid and weft guide passage formed on a sley and extended in the filling direction, said guide passage being defined by a plurality of cooperating guide walls and having an opening extending in said filling direction and subtending a given dimension in a vertical direction substantially perpendicular to said sley, said opening also extending in a longitudinal warp direction, a plurality of auxiliary nozzles disposed at predetermined intervals in said filling direction and substantially transversely directed to confront the opening of said guide passage, each of said auxiliary nozzles having a fluid jetting opening directed toward at least one of said cooperating guide walls defining said guide passage, an improved method comprising positively covering each of said at least one of said guide walls along the entire given direction of the adjacent part of said guide passage opening in said vertical direction by a diverging stream of an effective auxiliary fluid jetted from the fluid jetting opening of the cooperating auxiliary nozzle.

4,344,466

FLEXIBLE TYPE RAPIER LOOM

Junzo Hasegawa, Obu; Susumu Kawabata, Aichi; Kiichi Kono, Toyota, and Tetsuzo Inoue, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya, Japan

Filed Apr. 24, 1980, Ser. No. 143,335

Claims priority, application Japan, May 2, 1979, 54-54261

Int. Cl.³ D03D 47/12

U.S. Cl. 139—449 15 Claims

1. A flexible type rapier loom comprising:

a loom body having a plurality of warp threads in which a shed is formed in said warp threads;

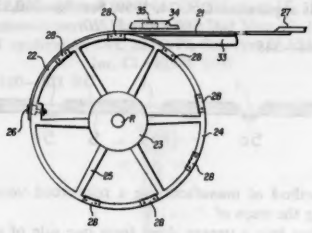
a wheel rotatably mounted on said loom body and oscillatedly driven back and forth and having an outer circumference;

a flexible tape which comprises an elastic and magnetic material fixed at one end thereof to said circumference of said wheel and fitted upon said circumference of said wheel and carrying a weft holder at the other end thereof;

means for inserting said flexible tape into said shed and

withdrawing said flexible tape from said shed such that a weft is inserted into said shed; and

a plurality of magnetic attracting means mounted on said circumference of said wheel to form a closed circuit mag-



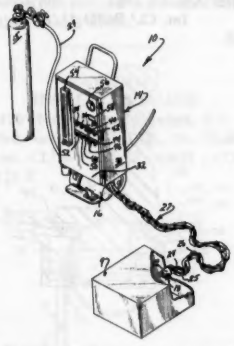
netic path between said flexible tape along said circumference of said wheel and each of said magnetic attracting means, for attracting said flexible tape to said circumference of said wheel by magnetic forces.

4,344,467

DEVICE FOR CHARGING CONTAINERS WITH AN INERT GAS

Frank U. Lahde, 966 Hemlock, Rochester, Mich. 48063

Filed Oct. 1, 1980, Ser. No. 192,724
Int. Cl.³ B65B *31/04*
U.S. Cl. 141—66 **8 Claims**



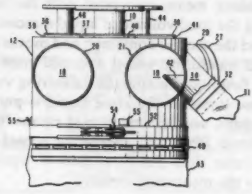
1. A device for charging a flexible receptacle containing deteriorative material with an inert gas comprising, in combination, a nozzle adapted for insertion in the receptacle, a control unit, a source of inert gas and a pump; said nozzle having a plurality of fittings, said fittings being associated with sensors to determine gas content and pressure within the receptacle, said pump being operable to selectively pressurize or evacuate said receptacle, said pump being connected to said nozzle by a vacuum hose for removing oxygen therethrough and to a conduit connected to said inert gas source and to an inert gas charging hose for filling said receptacle with an inert gas, said control unit having electric connections with said sensors and said pump, said control unit including sensor-responsive switch means for selectively operating the pump in gas charging or evacuating operation.

4,344,468

PROCESS AND APPARATUS FOR PACKAGING

Harry W. Sandberg, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 45,960, Jun. 6, 1979, Pat. No. 4,308,710.
This application Mar. 27, 1981, Ser. No. 248,346
Int. Cl.³ B65B *1/28*
U.S. Cl. 141—69 **10 Claims**



1. A bag-filling apparatus comprising, in combination:

(a) a housing having an open lower end, a side portion and a top portion, said side portion having three openings therein, and a plurality of apertures circumferentially arranged around the side portion adjacent the lower edge;

(b) a pair of gloves attached to two of the openings in said side portion, the third opening adaptable for attaching a bag thereto;

(c) means for securing a bag in a filling position around the open lower end, said means circumferentially disposed around the housing below the three openings and above the apertures;

(d) a product fill pipe extending into the housing and having a discharge end extending into the open end of the housing;

(e) means for applying a vacuum to the interior of the housing; and

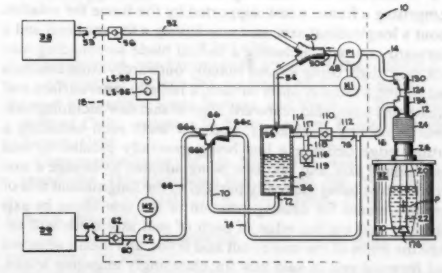
(f) means for applying a vacuum through the apertures from inside said housing.

4,344,469

LIQUID TRANSFER APPARATUS

Gregory J. Brown, San Jose, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Jun. 9, 1980, Ser. No. 157,599
Int. Cl.³ B08B *9/08*; B65B *3/04*
U.S. Cl. 141—90 **16 Claims**



1. An apparatus for transferring a selected volume of a first liquid from a first container to a second container and for rinsing the first container with a rinse liquid after the first container has been emptied comprising: means for supplying the rinse liquid; a nozzle assembly that is insertable into the first container including a suction tube for withdrawing liquid from

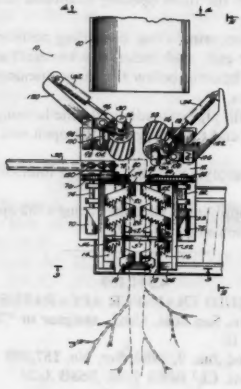
the first container and a rinse tube for spraying the interior of the first container with the rinse liquid; rinse pump means communicating between said rinse tube and said rinse liquid supplying means for selectively pumping rinse liquid from said supplying means into said rinse tube; a measuring vessel; suction pump means communicating between said suction tube of the nozzle assembly, said measuring vessel and the second container to which the first liquid is to be transferred for withdrawing liquid into the suction tube and directing such liquid in part to the measuring vessel and in remaining part to the second container; means associated with the measuring vessel for indicating the total volume of liquid directed to the measuring vessel and the second container; and means communicating between said measuring vessel and said rinse tube for withdrawing the first liquid within the measuring vessel and mixing with the rinse liquid as the rinse liquid is pumped from said supplying means, said last-mentioned means being adapted to withdraw liquid from said measuring vessel at a flow rate which is greater than the flow rate of liquid concurrently directed into the measuring vessel.

4,344,470

DELIMBING APPARATUS

Dennis Dubey, Menominee, Mich., assignor to Forest Country Engineering Co., Menominee, Mich.

Filed Nov. 24, 1980, Ser. No. 209,849
Int. Cl.³ A01G *23/02*
U.S. Cl. 144—2 Z **15 Claims**



1. A machine for removing limbs from trees, the machine comprising a frame, a saw supported by the frame for rotation about a longitudinal axis, said saw having a forward end and a rearward end, and including a helical blade surrounding said axis, said blade being spaced radially outwardly from said axis and having a radially outer surface, a radially inner surface and a rearward edge, said rearward edge of said saw including saw teeth projecting rearwardly, said saw teeth each including a cutting edge defining a line being generally parallel to said longitudinal axis, and said saw being adapted to engage a tree with the tree being generally parallel to the longitudinal axis of the saw, means for causing rotation of the saw about its axis whereby said cutting edge of each of said saw teeth will engage the limbs of the tree to cut said limbs, and means adjacent said forward end of said saw for clampingly engaging a tree, for pulling the tree in the direction of said longitudinal axis of the saw, and for rotating the tree as it is pulled along the saw, said means for pulling and rotating including a pair of rollers adapted to clampingly engage the tree, means for moving one of the rollers toward the other roller and into clamping engagement with the tree, and means for causing rotation of one of the rollers.

4,344,471

REINFORCED VENEER SHEET AND THE METHOD OF MANUFACTURING THE REINFORCED VENEER SHEET

Yasuhiro Ibuki, Ohbu, Japan, assignor to Meinan Machinery Works, Inc., Aichi, Japan

Division of Ser. No. 118,905, Feb. 6, 1980, Pat. No. 4,323,616. This application Oct. 24, 1980, Ser. No. 200,150
Int. Cl.³ B32B *21/10*
U.S. Cl. 144—345 **12 Claims**

1. A method of manufacturing a reinforced veneer sheet comprising the steps of

(1) cutting into a veneer sheet from one side of said sheet completely through to the other side thereof and across the grain of said sheet to form a closed cut therein;

(2) laying a length of cord on one side of the sheet such that an intermediate portion of the cord is positioned on said cut;

(3) forcing said cord intermediate portion through said closed cut to protrude outside the other side of the sheet so that said intermediate portion is clasped only by said closed cut extending across said grain; and

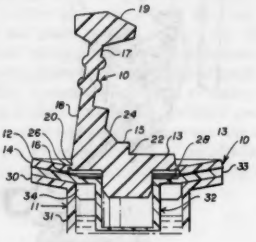
(4) repeating the steps of (1) to (3).

4,344,472

PULL TAB TEAR CAP FOR CONTAINER PORT

Mark E. Larkin, Lindenhurst, and Thomas W. Balistreri, Lake Bluff, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Apr. 13, 1981, Ser. No. 253,339
Int. Cl.³ B65D *33/16*
U.S. Cl. 150—8 **14 Claims**



1. An easily tear open closure for sealing the port structure of a container comprising:

a base portion defining a skirt member for securing to said port structure;

means defining a weakened tear path to provide removal of a section of said base portion;

a pull member extending away from said base portion;

a force directing means constructed and arranged between said pull member and said base portion at the junction therebetween to direct a pulling force into said tear path;

said removal section in said base portion being flexible so that said section can be pulled away from said base portion prior to a tearing away therefrom;

whereby a pulling force of substantially not more than 12 pounds will concentrate said force at said junction to initiate the tearing away of said removal section.

4,344,473
MEANS FOR SEPARATING LIGHT REFLECTIVE FABRICS

Ronald H. Shore, P.O. Box 130, Snowmass, Colo. 81654 (Jill Shore, conservator)

Continuation-in-part of Ser. No. 833,581, Sep. 15, 1977, and a continuation-in-part of Ser. No. 907,707, May 19, 1978. This application Oct. 22, 1979, Ser. No. 86,654
Int. Cl.³ E06B 9/08
U.S. Cl. 160—121 R 20 Claims

1. A curtain for dynamically insulating an area, said curtain comprising a hanging plurality of spaced parallel sheets closed around the perimeter thereof to form an air bag with a variable volume, means in the bottom of at least one of said hanging sheets for admitting or expelling air in an inhalation or exhalation process, means for rolling and unrolling said hanging sheets to enable said curtain to be emplaced in front of or removed from said area, said rolling means including a shield-like member with a deflation groove in a lower region of said shield-like member, said curtain passing through said deflation groove as it is rolled and unrolled, and separator means passing between said hanging plurality of sheets in the vicinity of the deflation groove, whereby said curtain must pass said separator means as said curtain is raised or lowered and thus preclude a clinging together of said sheets.

4,344,474
INSULATED SHADE

Joel Berman, 1470 Hewlett Ave., Hewlett, N.Y. 11557

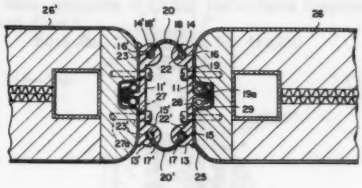
Filed Nov. 16, 1979, Ser. No. 94,694
Int. Cl.³ A47G 5/02; A47H 1/00
U.S. Cl. 160—121 R 3 Claims

1. A thermal insulating shade that has several layers of shade fabric comprising, a cylindrical shade roller having at least one longitudinal slot formed in the surface thereof, said slot having flanges that establish a gap therebetween, said flanges extending over a respective portion of the slot base, a snap fastener having a base and a pair of resilient generally radially protruding arms which each bear against a respective adjacent one of said flanges to retain said snap fastener within said slot, and a shade attachment member on only one of said arms and extending toward the shade fabric for fastening a layer of shade fabric thereto.

4,344,475
OFFICE PARTITION INTERCONNECTOR ASSEMBLY

Fred J. Frey, 2307 Foxdale Ter., Long Beach, Michigan City, Ind. 46360

Continuation of Ser. No. 935,041, Aug. 18, 1978, abandoned, which is a continuation of Ser. No. 829,386, Aug. 31, 1977, abandoned, which is a continuation of Ser. No. 673,492, Apr. 5, 1976, abandoned. This application May 5, 1980, Ser. No. 146,739
Int. Cl.³ A47G 5/00; E05D 7/00
U.S. Cl. 160—135 38 Claims



1. Office partition interconnector assembly comprising

a solid unitary support member having a main web means defining a continuous enclosing main boundary surface of selective cross-sectional profile provided along one surface portion thereof constituted as a rearward continuous surface portion with partition panel engaging means for fixedly mounting the support member on one partition panel and provided at another surface portion thereof constituted as a forward continuous surface portion with selectively positioned edge retaining external channel means including a pair of cooperating spaced apart individual wall means each independently projecting externally forwardly outwardly from the main boundary surface of the main web means at such forward surface portion and remotely from such rearward surface portion and terminating in corresponding substantially uniform thickness free edge portions in self disposed relation to the remainder of such support member and extending beyond the profile of the adjacent surface portion of the support member thereat and defining an open channel insert slot therebetween, and

a flexible web having an enlarged edge at one side thereof in continuous integral coextensive relation therewith for operative insertion between the cooperating wall means of the edge retaining channel means of the support member and attachment means at the other side thereof for attaching the web to another partition panel thereby to provide an interposed connection between such panels to form an office partition.

4,344,476
SUPERCOOL METHOD FOR PRODUCING SINGLE CRYSTAL MERCURY CADMIUM TELLURIDE

Edward Y. Sutcliffe, Santa Barbara, and Roger A. Cole, Goleta, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Continuation-in-part of Ser. No. 71,149, Aug. 30, 1979, abandoned. This application Dec. 8, 1980, Ser. No. 214,382
Int. Cl.³ B22D 27/04, 27/08; H01L 21/34
U.S. Cl. 164—76.1 6 Claims

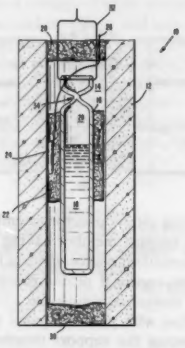
1. A process for producing single crystal $Hg_{1-x}Cd_xTe$ comprising the steps of:

(a) producing an ingot of $Hg_{1-x}Cd_xTe$ having a large number of crystallites with small grain boundaries by the steps of:

(1) adding predetermined amounts of mercury, cadmium and tellurium to a container to produce a stoichiometric mixture thereof of cadmium telluride molefraction x,

(2) heating said mixture to a predetermined temperature above liquidus,

(3) rocking said container at the same time to produce a homogeneous mixture of $Hg_{1-x}Cd_xTe$,
(4) discontinuing the application of heat to said container,
(5) terminating the rocking at +45° with respect to the vertical when the temperature of the mixture has dropped to about 8° C. above liquidus,
(6) supercooling said mixture by maintaining said container at the vertical until the temperature of said mixture drops an amount below liquidus which is a predetermined function of x, and



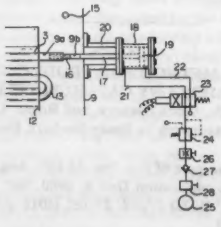
(7) quenching said mixture by exposing said container to ambient air temperature by rapidly withdrawing from the furnace so that there is produced an ingot of $Hg_{1-x}Cd_xTe$ having a large number of crystallites with small grain boundaries; and
(b) applying heat to said ingot so that a solid state recrystallization process yielding a large amount of single crystal $Hg_{1-x}Cd_xTe$ is achieved.

4,344,477

METHOD OF DIE CASTING A METALLIC CAST PRODUCT HAVING A METALLIC HOLLOW MEMBER EMBEDDED THEREIN

Isao Miki, Shimizu; Takeshi Kishihara, Fuji; Toshiyuki Kawai, Shimizu, and Naoyuki Furumaki, Shizuoka, all of Japan, assignors to Nippon Light Metal Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1980, Ser. No. 138,895
Claims priority, application Japan, Apr. 16, 1979, 54-45468
Int. Cl.³ B22D *19/12*
U.S. Cl. 164—98 **7 Claims**



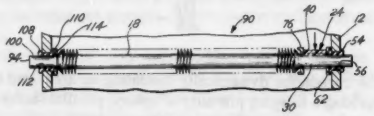
1. A method of die casting a metallic cast product having a hollow metallic member embedded therein utilizing a damping mechanism comprising:
sealingly enclosing a pressure resisting fluid medium within the interior of said hollow member;
placing said hollow member in position in a cavity formed between a pair of metallic die casting moulds;
injecting molten metal into the cavity;
generating internal pressure within the hollow member by thermal expansion of the fluid medium due to heat transmitted by the molten metal wherein said step of sealingly enclosing said pressure resisting fluid medium comprises:
sealingly mounting a slidable sealing plug to at least one open end of said hollow member so as to seal said pressure resisting fluid medium within the interior of said hollow member; and
relieving the internal pressure of the hollow member by allowing the sealing plug to slide against a resisting force of said damping mechanism when the internal pressure rises excessively.

4,344,478

HEAT EXCHANGE APPARATUS

Glen E. Petaja, and Charles E. Cedar, both of Hibbing, Minn., assignors to L & M Radiator, Inc., Hibbing, Minn.

Filed Jul. 31, 1980, Ser. No. 174,159
Int. Cl.³ F28F *9/06*
U.S. Cl. 165—69 **21 Claims**



1. In a heat exchange apparatus of the type having a support member, at least one heat exchange tube having two ends and a central portion, and means for securing the tube at each of its ends within the support member, said heat exchange tube having at least one heat exchange fin means attached to the outer periphery of the central portion and outwardly extending therefrom, the improvement comprising:
an elongated heat exchange tube retainer having an internal cross-section and an axial length, said cross-section defining means for attaching to one end of said heat exchange tube along the entire axial length of said retainer, the elongated tube retainer being mounted on an end of said heat exchange tube to provide means for securing the heat exchange tube within the support member and being of sufficient length to prevent longitudinal movement of the heat exchange tube within the support member.

4,344,479

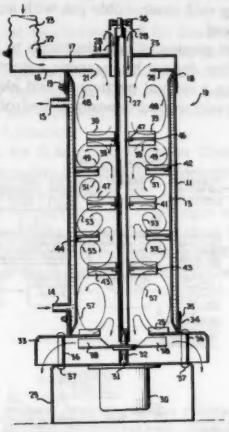
PROCESS AND APPARATUS UTILIZING COMMON STRUCTURE FOR COMBUSTION, GAS FIXATION, OR WASTE HEAT RECOVERY

Frank W. Bailey, New York, N.Y., assignor to Fuelsaver Company, Potomac, Md.

Filed Jul. 28, 1978, Ser. No. 928,811
Int. Cl.³ F28F *13/12*
U.S. Cl. 165—109 R **46 Claims**

1. In a thermal system, apparatus for increasing convection efficiency, comprising:
an enclosure having an inlet opening, an outlet opening, and a predetermined longitudinal axis;
means for supplying a substantially gaseous primary fluid at said inlet opening;
means for establishing a static pressure differential between said inlet and outlet openings to establish a continuous net flow of primary fluid longitudinally through said enclosure;
a thermal transfer wall exposed to said primary fluid in said enclosure;
means containing a secondary fluid in flow isolation from said primary fluid and in thermal conduction relationship with said primary fluid through said thermal transfer wall; and
rotatable means for mechanically stirring said primary fluid in said enclosure, said rotatable means including drive means and blade means driven by said drive means for

imparting at least one rotative flow component to said primary fluid along said thermal transfer wall with a flow



rate substantially greater than the primary fluid net flow rate from said inlet opening to said outlet opening caused by said pressure differential.

4,344,480

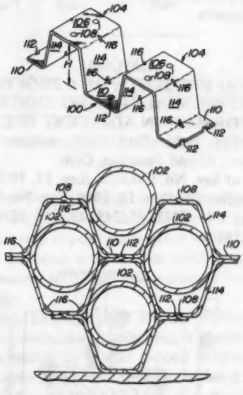
SUPPORT FOR HEAT EXCHANGE TUBES

Robert C. Boyer, Emmaus, and George J. Williams, Chalfont, both of Pa., assignors to Ecolaire Incorporated, Malvern, Pa.

Continuation-in-part of Ser. No. 891,677, Mar. 30, 1978, Pat. No. 4,210,202. This application Jun. 27, 1980, Ser. No. 163,543

Int. Cl.³ F28F *1/32*

U.S. Cl. 165—162 **5 Claims**



1. In a heat exchanger tube bundle assembly having a plurality of juxtaposed horizontally disposed tubes which comprises at least two sinusoidal tube support strips each having a plurality of members interconnected end to end, releasable interlock means on a plurality of said members to facilitate interlocking said strips with another in a manner so that a plurality of openings are provided therebetween for accommodating said horizontally disposed heat exchange tubes, said means including a plurality of projections on one strip and mating holes on an adjacent strip, each projection being integral in one piece with its associated strip, the improvement comprising said members being U-shaped so as to define a square pitch pattern of non-regular hexagon shaped openings whose converging sides are longer than horizontally disposed bights, said projections and holes being on the bights.

4,344,481

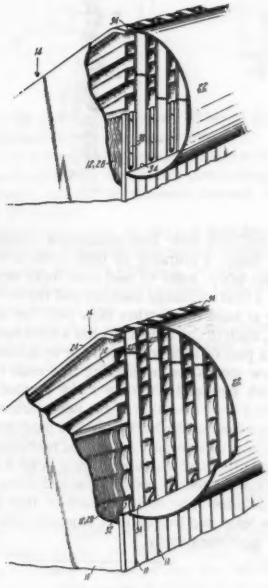
COUNTERFLOW HEAT EXCHANGER CONSTRUCTION

Robert G. Urie, Hartford, Conn., and John F. Kowinski, Springfield, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 23, 1980, Ser. No. 114,470

Int. Cl.³ F28F *9/02*

U.S. Cl. 165—166 **3 Claims**



1. A heat exchanger comprising:

a stack of air flow layers, each layer containing an arrangement of cooling fins;

rigid closure bars associated with each layer for containing air flow within the layer;

a manifold which is attached to the closure bars on one side of the stack, through which air is directed to the layers and which spans each layer for a distance D; and

characterized in that:

on one of the layers the manifold is attached to a closure bar that completely closes off access to the layer from the manifold;

in second and third layers adjacent said first layer there is an arrangement of thin cooling fins for directing air flow from the manifold through the layer and a second closure bar, to which the manifold is attached, to define a first opening to the layer from the manifold; and

said arrangement comprises at least one pliant, thin ribbon-like serpentine fin that extends along the edge of the layer from the point at which the second closure bar is attached to the manifold to define, within said first opening, a second smaller opening to the other fins in the arrangement.

4,344,482

MULTIPLE FLOW CONDENSER FOR AIR CONDITIONING UNITS OF MOTOR VEHICLES

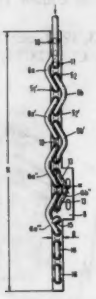
Kurt Dietzsch, Leonberg-Eltingen, Fed. Rep. of Germany, assignor to Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG, Fed. Rep. of Germany

Filed Dec. 29, 1980, Ser. No. 221,326

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1979, 2952736

Int. Cl.³ F28F 9/22, 9/26

U.S. Cl. 165—172 13 Claims



1. A multiple flow heat exchanger comprising a heat exchanger body, a plurality of tube forks arranged in the heat exchanger body, some of said tube forks defining a first flow path for a heat exchange medium and the remaining tube forks defining at least one further flow path for the heat exchange medium, each of the tube forks has a substantially U-shape and include a pair of legs with each leg terminating in a free end, and elbow means for connecting free ends of respective tube forks with free ends of tube forks located downstream, as viewed in a flow direction of the heat exchange medium, so as to enable a flow of the heat exchange medium in the respective flow paths, characterized in that the plurality of tube forks are arranged in the heat exchanger body in such a manner that the legs of all of the tube forks are arranged in one plane, the elbow means includes tube sections, and in that the tube sections bridge at least two free ends of adjacent tube forks and extend laterally past each other.

4,344,483

MULTIPLE-SITE UNDERGROUND MAGNETIC HEATING OF HYDROCARBONS

Charles B. Fisher, 2850 Hill Park Rd., Montreal, Quebec, Canada H3H 1T1, and Sidney T. Fisher, 53 Morrison Ave., Montreal, Quebec, Canada H3R 1K3

Filed Sep. 8, 1981, Ser. No. 300,188

Int. Cl.³ E21B 43/24, 43/243

U.S. Cl. 166—248 8 Claims

1. The method of producing hydrocarbon fluids from a part of one or more second underground deposits of hydrocarbons with a relatively small proportion of uncombined carbon, which comprises:

injecting a conducting liquid into a first part of a first underground deposit of hydrocarbons with a substantial proportion of uncombined carbon, and

heating said first part of said first deposit by a varying magnetic field, under conditions of controlled pressure and temperature, and

recovering substantially all fluid hydrocarbons present in and released from said first part of said deposit by said heating by said varying magnetic field, and

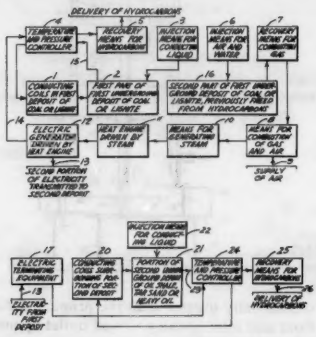
injecting air and water into a second part of said first deposit from which substantially all hydrocarbon fluids have been previously recovered by the method of this claim, and

combusting said air injected into said second part of said first deposit with substantially all of said uncombined carbon, in the presence of steam, so as to produce and deliver to the surface a combustible gas, and

combusting said combustible gas with air to generate electricity, and

using a first portion of said electricity to heat said first part of said first deposit by magnetic induction, and

transmitting a second portion of said electricity to one or more of said second deposits of hydrocarbons, and


DELIVERY OF HYDROCARBONS
TEMPERATURE AND PRESSURE CONTROLLER
RECOVERY MEANS FOR HYDROCARBONS
INJECTION MEANS FOR CONDUCTING LIQUID
INJECTION MEANS FOR AIR AND WATER
RECOVERY MEANS FOR COMBUSTION GAS
CONDUCTING COILS IN FIRST DEPOSIT OF COAL OR LIGNITE
FIRST PART OF FIRST UNDERGROUND DEPOSIT OF COAL OR LIGNITE
SECOND PART OF FIRST UNDERGROUND DEPOSIT OF COAL OR LIGNITE, HYDROCARBONS FROM HYDROCARBONS
ELECTRIC GENERATOR DRIVEN BY HEAT ENGINE
HEAT ENGINE DRIVEN BY STEAM
MEANS FOR GENERATING STEAM
MEANS FOR COMBUSTION OF GAS AND AIR
SECOND PORTION OF ELECTRICITY TRANSMITTED TO SECOND DEPOSIT
SUPPLY OF AIR
INJECTION MEANS FOR CONDUCTING LIQUID
ELECTRIC TERMINATING EQUIPMENT
CONDUCTING COILS IN SECOND UNDERGROUND PORTION OF SAID SECOND DEPOSIT
PORTION OF SECOND UNDERGROUND DEPOSIT OF OIL SHALE, TAR SAND OR HEAVY OIL
TEMPERATURE AND PRESSURE CONTROLLER
RECOVERY MEANS FOR HYDROCARBONS
ELECTRICITY FROM FIRST DEPOSIT
DELIVERY OF HYDROCARBONS

using said second portion of said electricity to generate a varying magnetic field in at least a part of one of said second deposits of hydrocarbons, and

injecting a conducting liquid into said part of said second deposits subjected to said varying magnetic field, and

heating said part of said second deposits subjected to said varying magnetic field, under conditions of controlled pressure and temperature, and

recovering at the earth's surface said fluid hydrocarbons released by said magnetic heating of said part of said second deposits.

4,344,484

DETERMINING THE LOCUS OF A PROCESSING ZONE IN AN IN SITU OIL SHALE RETORT THROUGH A WELL IN THE FORMATION ADJACENT THE RETORT

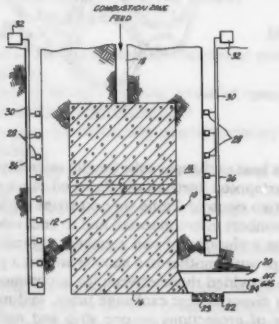
Richard D. Ridley, Bakersfield, Calif., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Continuation of Ser. No. 934,625, Aug. 17, 1978, abandoned.

This application Dec. 18, 1980, Ser. No. 217,992

Int. Cl.³ E21B 43/243, 43/247, 47/06

U.S. Cl. 166—251 20 Claims



20. A method for measuring a condition affected by a processing zone advancing through a fragmented permeable mass of formation particles containing oil shale in an in situ retort in

a subterranean formation containing oil shale, the retort having a processing zone advancing therethrough affecting at least one condition within the retort, the method comprising the steps of:

forming at least one monitoring well for monitoring in such well at least one condition affected by the processing zone advancing through the fragmented mass, such monitoring well extending through the subterranean formation adjacent the retort and separated from the retort by a zone of unfragmented formation;

providing means for fluid communication through the unfragmented formation between the fragmented mass and such a monitoring well; and

monitoring in the monitoring well for changes in at least one condition affected by the processing zone in the fragmented mass in the retort and communicated to such a monitoring well via the means for fluid communication.

4,344,485

METHOD FOR CONTINUOUSLY PRODUCING VISCOUS HYDROCARBONS BY GRAVITY DRAINAGE WHILE INJECTING HEATED FLUIDS

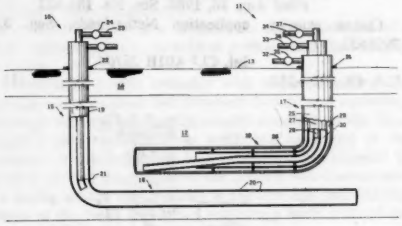
Roger M. Butler, Calgary, Canada, assignor to Exxon Production Research Company, Houston, Tex.

Filed Jun. 25, 1980, Ser. No. 162,720

Claims priority, application Canada, Jul. 10, 1979, 331464

Int. Cl.³ E21B *43/24, 43/26*

U.S. Cl. 166—271 **21 Claims**



16. A process for producing normally immobile bitumen from a tar sand deposit which comprises:

(a) penetrating said deposit with a first wellbore for injecting steam and a second wellbore for producing bitumen, said first and second wellbores lying along a fracture trend of said deposit;

(b) completing said first and second wellbores such that during the production of bitumen, a predetermined level of bitumen builds up in said second wellbore with throttled production, said level being calculated so as to assure that in the deposit mobilized bitumen flows substantially separate from the steam injected into said deposit;

(c) injecting steam into said first wellbore initially at fracture pressure or above to create a fracture between said wellbores and a steam chamber surrounding said fracture,

(d) continuing to inject steam at a reduced rate to heat said bitumen thereby causing said steam chamber to gradually expand in said formation as said bitumen becomes heated by conduction, mobilizes, and flows downward by gravity towards said second wellbore substantially separate from any steam condensate;

(e) producing said bitumen at rates which establish said predetermined level of mobilized bitumen in said wellbore.

4,344,486

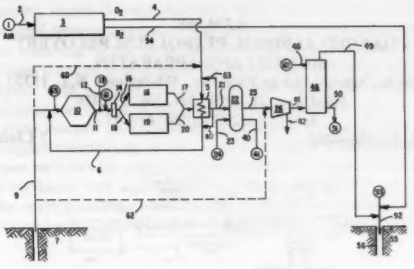
METHOD FOR ENHANCED OIL RECOVERY

David R. Parrish, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 27, 1981, Ser. No. 238,874

Int. Cl.³ E21B *43/24, 43/40*

U.S. Cl. 166—272 **12 Claims**



1. A method for the enhanced recovery of liquid hydrocarbons from underground formations comprising:

recovering a mixture comprising carbon dioxide and about 5 to about 90 mol percent contaminants comprising hydrocarbon, hydrogen sulfide, or mixtures thereof, from an underground formation;

combusting said mixture with an oxygen enriched gas to form a concentrated carbon dioxide stream containing less than about 10 mol percent nitrogen, oxygen, oxides of nitrogen, hydrocarbon, hydrogen sulfide, carbon monoxide, or mixtures thereof; and

injecting at least a portion of said concentrated carbon dioxide stream into an underground formation to enhance recovery of liquid hydrocarbon.

4,344,487

MODIFIED LIGNOSULFONATES AS ADDITIVES IN OIL RECOVERY PROCESSES INVOLVING CHEMICAL RECOVERY AGENTS

George Kalfoglou, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 901,165, Apr. 28, 1978, abandoned, and a continuation-in-part of Ser. No. 807,948, Jun. 20, 1977, abandoned, and a continuation-in-part of Ser. No. 745,505, Nov. 26, 1976, abandoned, and a continuation-in-part of Ser. No. 745,496, Nov. 26, 1976, abandoned, and a continuation-in-part of Ser. No. 745,495, Nov. 26, 1976, abandoned, and a continuation-in-part of Ser. No. 745,494, Nov. 26, 1976, abandoned. This application Mar. 17, 1980, Ser. No. 130,911

Int. Cl.³ E21B *43/22*

U.S. Cl. 166—274 **9 Claims**

1. In a method for recovering oil from a subterranean formation containing oil and having an injection well and a production well wherein an aqueous surfactant solution is injected into the injection well in order to drive the oil to the production well wherein it is produced the improvement which comprises:

injecting into the injection well in admixture with the surfactant solution lignosulfonates modified by oxidation with oxygen or ozone and sulfomethylation wherein the methylene sulfonate radical is added to the lignosulfonate wherein the lignosulfonates are present in an amount effective for reducing the extent of adsorption of the surfactant by the formation matrix.

2. In a method for recovering oil from a subterranean formation containing oil and having an injection well and a production well wherein an aqueous surfactant solution is injected into the injection well in order to drive the oil to the production well wherein it is produced the improvement which comprises:

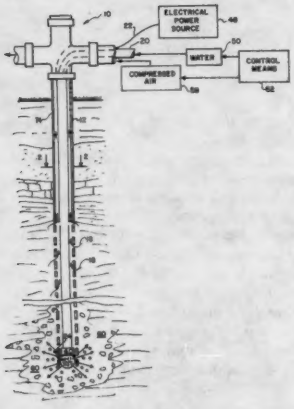
injecting into the injection well in admixture with the surfactant solution lignosulfonates modified by oxidation with oxygen or ozone and reaction with chloroacetic acid whereby said chloroacetic acid reacts with phenolic, hydroxyl and sulfonate groups in said lignosulfonates to yield carboxylate groups wherein the lignosulfonates are present in an amount effective for reducing the extent of adsorption of the surfactant by the formation matrix.

4,344,488

CHARGED AEROSOL PETROLEUM RECOVERY METHOD AND APPARATUS

Alvin M. Marks, 153-16 10th Ave., Whitestone, N.Y. 11357

Filed Aug. 18, 1980, Ser. No. 178,916
Int. Cl.³ E21B *43/24, 43/243*
U.S. Cl. 166—303 **7 Claims**



1. Apparatus for removing petroleum from a well having a well pipe which extends from an oil-bearing formation to the surface, comprising:

(a) means for delivering a liquid to the bottom of the well;

(b) means for controlling the amount of liquid delivered to the bottom of the well;

(c) means for delivering a gaseous fluid to the bottom of the well;

(d) means for controlling the amount of said gaseous fluid delivered to the bottom of the well;

(e) a charged aerosol generator for generating from said liquid fine droplets at the bottom of the well; and

(f) means for generating heat at the bottom of the well to vaporize said fine droplets of liquid.

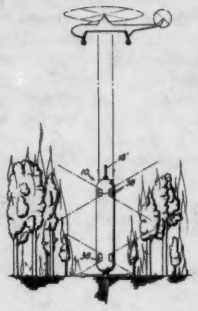
4,344,489

AERIAL FOREST FIRE EXTINGUISHING DEVICE

Al Bonaparte, 180 Luckie St., Atlanta, Ga. 30303

Filed Sep. 22, 1980, Ser. No. 190,013
Int. Cl.³ A62C *3/02*
U.S. Cl. 169—70 **2 Claims**

1. An aerial forest fire extinguishing device which disperses its contents on impact with the ground, comprising: an elongated, hollow body having an interior surface and having a plurality of ports therethrough, a bottom and an opposed end and capable of storing an inert gas under pressure; a shaft longitudinally extending through said body and having opposed ends which are external of said body, said shaft being slideably received through said body; a point capable of penetrating the ground and formed at the termination of the end of said shaft adjacent said bottom; means for preventing the penetration of said body into the ground upon said impact; closure means for said ports which are moveable between a closed position and an open position; means for maintaining said closure means in said closed position prior to said impact and said shaft is coupled to the closure means so that as the point impacts with the ground the shaft is moved upwardly causing the closure means to move to the open position, and a plurality



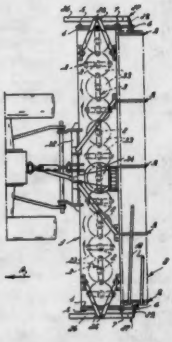
of rings which are radially spaced along said shaft within said body and which have outer peripheries which are secured to said interior surface to provide an internal brace for said device, said shaft being slideable through the center of said rings.

4,344,490

SOIL CULTIVATING IMPLEMENT

Ary van der Lely, Maasland, Netherlands, assignor to C. Van der Lely N.V., Maasland, Netherlands

Filed Aug. 26, 1980, Ser. No. 181,422
Claims priority, application Netherlands, Sep. 5, 1979, 7906631
Int. Cl.³ A01B *29/04*
U.S. Cl. 172—253 **11 Claims**

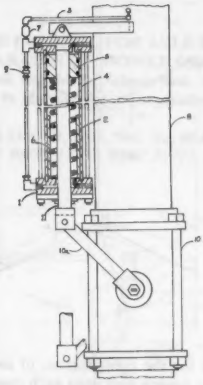


1. A soil cultivating implement comprising a frame and soil-working means supported on said frame, including a supporting roller connected to said frame, said roller comprising elongate elements that extend generally transverse to the direction of implement travel and said elements being permanently secured to the peripheries of spaces apart supporting discs, at least one auxiliary element being detachably secured to said discs, said peripheries defining crescent-shaped recesses and matchingly sector shaped stops along the length of the auxiliary element being received in said recesses, quick release means detachably securing said auxiliary element to the outer two discs in operative position, said elements and auxiliary element forming a ground-engaging surface of said roller.

4,344,491
APPARATUS FOR ACTUATING DOWNHOLE FLOW CONTROL VALVES

James J. Nolan, Brielle, and John E. Coakley, Westfield, both of N.J., assignors to Slurry Mining Engineering Inc., Westfield, N.J.

Division of Ser. No. 136,283, Apr. 1, 1980. This application Jul. 13, 1981, Ser. No. 282,913
Int. Cl.[3] E21C *45/00*
U.S. Cl. 175—317 4 Claims



1. An apparatus for actuating downhole flow control valves in the discharge conduit of a borehole mining tool with a hydraulic power cylinder actuated by the fluid supply pressure to the mining tool comprising:

(a) a control or lever arm attached to the valve stem of a flow control valve in its normal position in a fluid supply conduit;

(b) a hydraulic power cylinder with a piston within the cylinder and a piston rod attached thereto and extending through the cylinder and pivotally attached to the flow control valve arm or lever while the head end of the cylinder is pivotally attached to a structural support to permit arcuate movement of the control valve lever arm;

(c) a spring within the cylinder at the rod end and holding the piston at the head end when subjecting both ends of the cylinder to drilling pressure;

(d) a piston stop within the rod end of the cylinder to stop movement of the piston after a change in valve position;

(e) piping connecting the fluid supply conduit of the drill string to each end of the actuating cylinder and with the position of the piston being held at the head end of the cylinder by the internal spring which is capable of resisting movement of the piston while drilling system pressure is applied to both ends of the cylinder;

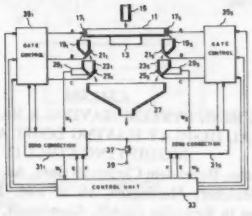
(f) means for increasing the fluid supply pressure to mining system pressure and applying the pressure to each end of the cylinder which forces the piston opposed by the spring against the stop with the piston rod actuating the control valve arm changing the position of the valve.

4,344,492
AUTOMATIC COMBINATION WEIGHING MACHINE WITH IMPROVED ZERO-POINT CORRECTION

Takashi Hirano, Kobe, Japan, assignor to Yamato Scale Co. Ltd., Hyogo, Japan

Filed Jan. 12, 1981, Ser. No. 224,444
Claims priority, application Japan, Apr. 14, 1980, 55-2895
Int. Cl.[3] G01G *19/04, 19/00, 13/14;* B07C *5/16*
U.S. Cl. 177—25 4 Claims

1. An automatic combination weighing machine, comprising a plurality of weighing units each including a weighing cradle for carrying articles to be weighed and weight sensing means for producing an electric signal indicative of the weight of said articles, said weighing cradle having an exhaust gate controlled by a first control signal for exhausting the content into collecting means, supply means having a plurality of discharge gates facing respectively said weighing cradles of said weighing units and controlled by a second control signal for supplying said articles from a source of articles to said weighing cradles, means for transferring the output signals of said weight sensing means through normally-open switches each having a control terminal, respectively, to a common summing device for summing up the incoming signals to produce a sum signal, means coupled to said summing device for comparing said sum signal with a predetermined range of weight to produce a comparison output when the sum is within said range, combination control means having a plurality of output terminals coupled respectively to the control terminals of said normally-open switches for producing outputs at said output terminals in accordance with a predetermined set of combinations to close the corresponding normally-open switches successively, memory means having a plurality of input terminals coupled respectively to the output terminals of said combination control means, corresponding output terminals and a control input terminal for receiving said comparison output, for responding to said comparison output to store the outputs of said combination control means and, at the same time, discharge the content from the corresponding output terminals for a predetermined period of time, and gate control means for responding to the outputs of said memory means to supply said first and second control signals to the corresponding ones of said weighing units, a plurality of zero-point correction devices inserted respectively in the signal paths for transferring the outputs of said weight sensing means to said summing device, for responding to an energizing signal to cancel its input level to produce a zero-level output, means for producing a zero-point correction command signal, and correction control means coupled to said gate control means and said zero-point correction devices for responding to said zero-point correction command signal to inhibit application of said second control signal and to sense application of said first control signal to apply said energizing signal to said zero-point correction devices.



4,344,493
HIGH-SPEED WEIGHING AND CONVEYING APPARATUS

Andrew R. Salmonsen, Pennsauken, N.J., and William J. Feehery, Jr., Ardmore, Pa., assignors to Campbell Soup Company, Camden, N.J.

Filed Mar. 6, 1981, Ser. No. 241,121
Int. Cl.[3] G01G *13/00, 19/00;* B07C *5/16*
U.S. Cl. 177—52 24 Claims

16. Apparatus for the high-speed conveying and weighing of open-topped containers, comprising:

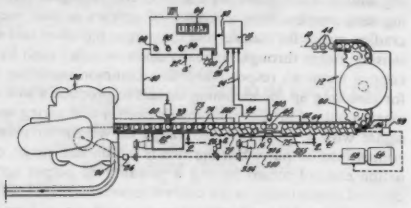
a filler station for filling open-topped containers with product;

a weighing station comprising a high-speed weigher for weighing the filled open-topped containers;

a container-closing station for closing the tops of said container;

track means for slidingly supporting said containers in a sequential train, and extending from said filler station to said container-closing station;

said conveyor means comprising means for establishing



guiding and controlling contact with each of said containers leaving said filling station and for maintaining such contact from said filler station to said container-closing station to control the position of each of said containers at all times.

4,344,494

MEASURING SYSTEM HAVING A BALANCE WITH DIGITAL DISPLAY HAVING DIGIT APPEARANCE MODIFYING CIRCUIT

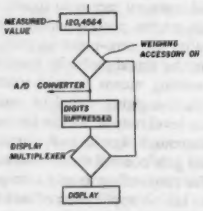
Erich Knothe, Bovenden; Christoph Berg, Adelebsen, and Franz-Josef Melcher, Hardegsen, all of Fed. Rep. of Germany, assignors to Sartorius GmbH, Goettingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 900,642, Apr. 25, 1978. This application May 5, 1980, Ser. No. 146,399

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1977, 2718769

Int. Cl.³ G01G *3/14*

U.S. Cl. 177—210 R **28 Claims**



1. In a measuring system adapted to weigh changing amounts of material, the system which includes a balance, analog-to-digital converter means responsive to output signals from the balance for producing digital signals representative of weight, counter means responsive to said output signals from said converter means, a measuring display device for continuously showing measured values and circuit means coupled between said counter means and said display device for transferring measured values at at least one predetermined frequency to the display device, the improvement wherein said circuit means includes accessory circuit means for modifying at least the last digit appearing on said display device to distinguish it optically from the other digits, switch means coupled to said accessory circuit means for selectively activating said accessory circuit means, and said circuit means comprising means to change said frequency in accordance with the speed at which the amount of material being weighed is changing as the weighing is being done.

4,344,495

EQUIPMENT FOR THE MEASUREMENT OF MINUTE WEIGHT FORCES

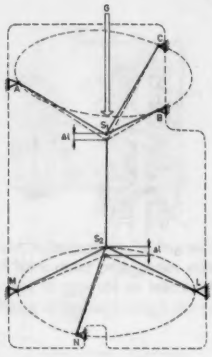
Sandor Kovacs, Budapest, Hungary, assignor to Vasipari Kutato Intezet, Hungary

Filed Jun. 17, 1980, Ser. No. 160,355

Claims priority, application Hungary, Nov. 6, 1979, VA 1556

Int. Cl.³ G01G *3/14, 21/24*

U.S. Cl. 177—211 **17 Claims**



1. Equipment for the measurement of small weight forces, characterized by having two units each containing three measuring arms, each measuring arm having a first end connected with each other in one point, where the connection points (S_1, S_2) of the measuring arms of each unit are attached to an extension bar and the second ends of the measuring arms are attached to a single rigid element in such a way that the connection points at said first ends of the measuring arms in the units are outside the planes defined by the second ends of the measuring arms that are attached to the rigid elements.

4,344,496

INTEGRAL PARALLELOGRAM LOAD RECEIVER

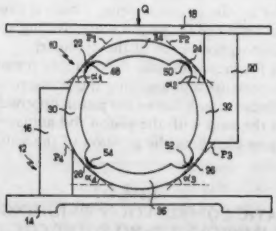
Jacques F. Langlais, Coudray Monteraux, and Jean-Claude Valadier, Paris, both of France, assignors to Testut-Aequitas, Paris, France

Filed Nov. 13, 1980, Ser. No. 206,387

Claims priority, application France, Nov. 16, 1979, 79 28300

Int. Cl.³ G01G *3/14, 3/08;* G01L *5/12*

U.S. Cl. 177—211 **9 Claims**



1. A load receiver comprising a fixed upright assembly including an arcuate section integral with a frame, a loaded upright assembly including an arcuate section integral with a load-carrying plate and two arcuate arms hinged onto the arcuate sections to form therewith a deformable parallelogram, the two arcuate sections and the two arcuate arms together forming a circular ring-shaped integral structure comprised between a circular internal profile and a circular external

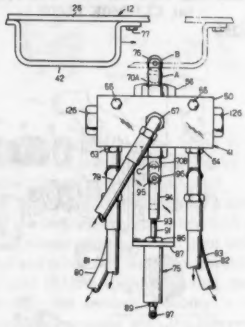
profile and provided with constrictions in the internal and/or external circular profile which define the hinges of the deformable parallelogram, and a load transducer provided to detect the deformation of the parallelogram under the effect of a load applied on the plate, at least some of the constrictions having in their flexion zone a neutral line, the slope of which is inclined to the horizontal.

4,344,497

OVERRIDE CONTROL FOR AXLE LOCKING APPARATUS OF MOBILE CRANE

Ram N. Rathi, and Ronald E. Nelson, both of Cedar Rapids, Iowa, assignors to Harnischfeger Corporation, West Milwaukee, Wis.

Filed Oct. 19, 1979, Ser. No. 86,661
Int. Cl.³ B60G *17/00*; B66C *13/12, 23/04*
U.S. Cl. 180—41 **5 Claims**



1. In a mobile crane comprising:

a lower carrier frame, an upper crane section pivotally mounted on said carrier frame for rotation thereon about a vertical axis;

an oscillatable axle assembly with ground engaging means attached thereto, means pivotally mounting said axle assembly to said carrier frame for rotation about a horizontal axis;

locking fluid cylinder means including a cylinder housing with an extendable/retractable piston rod therein, means pivotally mounting either of said piston rod or said cylinder housing to said axle assembly and the other of said piston rod or said cylinder housing rigidly to said carrier frame;

locking valve means mounted on said carrier frame for controlling said fluid cylinder means, conduit means connecting said locking valve means to said fluid cylinder means, said locking valve means including a housing, a plurality of check valves therein and first and second independently movable valve stem means extending from said housing and operative to open and close said check valve means;

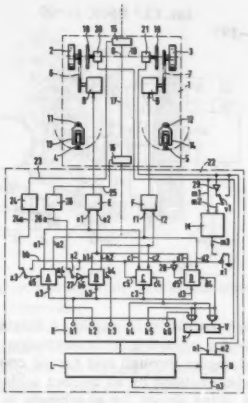
cam means mounted on said upper section and engageable with said first valve stem means when said upper section is rotated to a predetermined position to open said check valve means for permitting said axle assembly to pivot about said horizontal axis, power means connected to said second valve means, manually operated control means operatively connected to said power means to selectively actuate said second valve stem to open said check valve means when said upper section is in any of its rotatable position other than said predetermined position.

4,344,498

AUTOMATIC STEERING MEANS FOR A DRIVERLESS CARRIAGE

Olof H. Lindfors, Vegagatan 32, S-413 09 Göteborg, Sweden

Filed Dec. 27, 1979, Ser. No. 107,601
Claims priority, application Sweden, Jan. 2, 1979, 7900011
Int. Cl.³ B62D *1/28*
U.S. Cl. 180—168 **6 Claims**



1. In a driverless carriage comprising

a carriage chassis,

at least three wheels for supporting said chassis,

motor means and transmission means for driving at least one of said wheels,

first bearing means for not more than two of said wheels, said first bearing means being arranged to define a single geometrical axis of said wheel or wheels which extends in a fixed horizontal direction with respect to the chassis,

second bearing means for the remaining at least one supporting wheel, said second bearing means being pivotably connected to the chassis to allow adjustment of the direction of said at least one supporting wheel with respect to the chassis and thus to enable the carriage to turn about a vertical slewing axis intersecting said single geometrical axis, and,

steering means for adjusting the position of said slewing axis with respect to the chassis,

the improvement comprising

means for monitoring the position of said slewing axis including

at least one non-driven measuring wheel arranged to engage the surface supporting the carriage, said measuring wheel having a horizontal geometrical axis extending in the same vertical plane as said single geometrical axis, and,

signal generating means arranged to be operated by said at least one measuring wheel for generating a signal representing the rate of rotation of the measuring wheel,

said monitoring means being arranged to provide an output signal derived from the signal generated by said signal generating means so as to have a sign representing forward and backward movement respectively and a magnitude representing the rate of speed, with respect to the surface supporting the carriage, of a predetermined point of said single geometrical axis, said point defining a desired position of said slewing axis, and,

means controlled by said output signal for operating said steering means in such a way as to cause said steering means to adjust the slewing axis into said desired position.

4,344,499

TRACTOR WITH ANTI-SLIPPING AND OVERLOADING CONTROLS

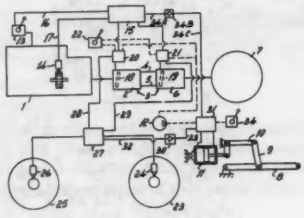
Ary van der Lely, Maasland; Cornelis J. G. Bom, Rozenburg, and Arie Kuipers, Brielle, all of Netherlands, assignors to C. van der Lely N.V., Maasland, Netherlands

Filed Dec. 3, 1979, Ser. No. 99,732

Claims priority, application Netherlands, Dec. 8, 1978, 7811964

Int. Cl.³ B60K *31/00*

U.S. Cl. 180—197 15 Claims



1. A tractor comprising an engine, a torque converter including means for adjusting its transmission ratio, a wheel driven by said engine through said torque converter, at least one further wheel rotated by its contact with the underlying ground, and a lifting device for attachment to an implement, the tractor further comprising control means adapted to adjust automatically the transmission ratio of said torque converter in dependence on slipping of said driven wheel with respect to the ground compared to the rotation of said further wheel, said control means comprising counters which operatively count the revolutions of said driven wheel and the revolutions of said further wheel and a comparator which provides a signal when there is a predetermined difference between the respective revolutions of said driven wheel and said further wheel, said control means adjusting said transmission ratio to decrease the speed of said tractor in response to said signal.

4,344,500

POWER TRANSMISSION CASING APPARATUS IN MOTORIZED TWO-WHEELED VEHICLE

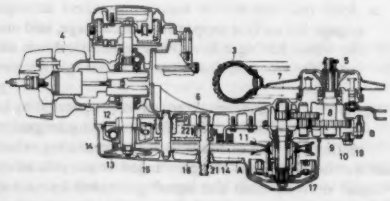
Noboru Kurata, Kamifukuoka; Kunio Miyazaki, Oi, and Kuniyuki Yamamoto, Kodaira, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1980, Ser. No. 178,942

Claims priority, application Japan, Aug. 21, 1979, 54-105543

Int. Cl.³ B62M *9/06*

U.S. Cl. 180—230 3 Claims



1. A power transmission casing apparatus in a motorized two-wheeled vehicle comprising

a case main body extending from one lateral side of an internal combustion engine to one lateral side of a rear wheel positioned rearwardly of said engine, said case main body rotatably supporting a wheel axle of said rear wheel and partially housing in a rear portion a reduction gear means which comprises the wheel axle, an input shaft, and a gear train operatively interconnecting the input shaft to the wheel axle, said casing apparatus also housing V-belt means comprising a rear pulley on the input shaft, a forward pulley on an output shaft of the engine and a V-belt operatively connecting the pulleys, each of the pulleys having a circumferential periphery;

a transmission cover member sealingly engaging with said case main body in a fluid tight manner and extending to enclose said reduction gear means, said input shaft extending through said transmission cover member; and

a V-belt cover sealingly engaging with the case main body and extending from beyond the forwardmost portion of the periphery of the forward pulley to beyond the rearmost portion of the periphery of the rear pulley to enclose the V-belt means.

4,344,501

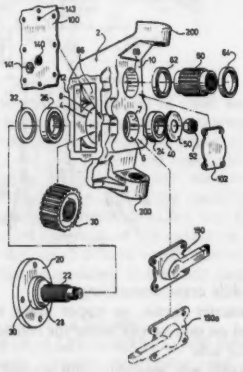
GEARED HUB

James H. Jerry, and Ira A. Dickie, both of Goderich, Canada, assignors to Gearco Limited, Goderich, Canada

Filed Aug. 18, 1980, Ser. No. 179,003

Int. Cl.³ B60K *17/30*

U.S. Cl. 180—253 18 Claims



1. A geared hub for driving wheel of a vehicle comprising a one-piece cast housing having an elongated gear chamber, a wheel spindle extending through said chamber and generally perpendicular thereto, an output gear and an input pinion, said output gear driving said wheel spindle and in mesh with said input pinion; said housing having first access means for receiving and supporting said wheel spindle, second access means for receiving an input shaft associated with said input pinion and third access means in a sidewall of said housing for inserting said output gear, said first and second access means being in the end walls of said gear chamber, and including means for closing said access means, said one-piece housing including means for mounting said housing to a vehicle.

4,344,502

PASSIVE SEATBELT SYSTEM

Gosaku Terabayashi, Aichi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 5, 1979, Ser. No. 90,918

Claims priority, application Japan, Nov. 6, 1978, 53-136548

Int. Cl.³ B60R *21/10*

U.S. Cl. 180—268 16 Claims

1. A passive seatbelt system of the type wherein an occupant of a vehicle engages a part of the seatbelt webbing with a convenience holder provided on the vehicle when he gets out of the vehicle, said system comprising:

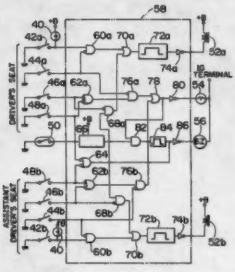
seated condition detecting means for detecting the seated condition of the occupant and providing a signal;

closed door detecting means for detecting the condition of the vehicle door being closed and providing a signal;

withdrawn webbing detecting means for detecting the condition of the seatbelt webbing being withdrawn and providing a signal;

vehicle speed detecting means for detecting that the running speed of the vehicle exceeds a predetermined speed;

automatic release means for releasing the seatbelt webbing



from the convenience holder by being activated for a predetermined time, thereby automatically fastening the seatbelt webbing over the occupant; and

control circuit means for activating said automatic release means for a predetermined time when said seated condition detecting means and said closed door detecting means are activated and when said withdrawn webbing detecting means and said vehicle speed detecting means are activated, whereby the seatbelt webbing is automatically fastened over the occupant with the convenience holder being released by said automatic release means.

4,344,503

DIAPHRAGM FOR ELECTRO-ACOUSTIC TRANSDUCER

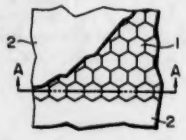
Akira Nakamura, Shizuoka, and Takao Nakaya, Hamamatsu, both of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jan. 23, 1981, Ser. No. 227,713

Claims priority, application Japan, Feb. 1, 1980, 55-9994; Feb. 1, 1980, 55-9995

Int. Cl.³ H04R 7/00

U.S. Cl. 181—170 **17 Claims**



1. A diaphragm for an electro-acoustic transducer, comprising:

a core member; and

a skin member disposed to at least one side of said core member and being made with a layer of ceramics material which covers substantially the entire surface of the core member, wherein said ceramics material is a metal oxide selected from the group consisting of berrylia (BeO), alumina (Al_2O_3), magnesia (MgO), silicon dioxide (SiO_2) and titania (TiO).

4,344,504

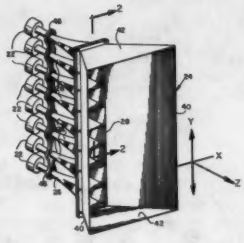
DIRECTIONAL LOUDSPEAKER

Bruce Howze, Springfield, Pa., assignor to Community Light & Sound, Inc., Philadelphia, Pa.

Filed Mar. 27, 1981, Ser. No. 248,504

Int. Cl.³ G10K 11/02

U.S. Cl. 181—187 **14 Claims**



1. A loudspeaker, having controlled planar sound dispersion characteristics, comprising:

a plurality of individual electroacoustical drivers, having horns expanding in cross-section, said horns having exit apertures aligned and joined to form an elongated line source, defining an axis of projection for sound energy; and,

a waveguide having an elongated input portion corresponding to and parallel with said line source and side walls defining an expanding cross-section from said input portion to an exit aperture of said waveguide, whereby sound dispersion off said axis is minimized.

4,344,505

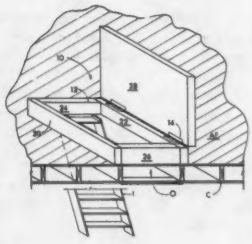
INSULATION CAP FOR DISAPPEARING STAIRWELLS

E. Eugene Waters, 107 E. Westwood Dr., and Gordon E. Harrell, Rte. 6, Box 130, both of Goldsboro, N.C. 27530

Filed Aug. 14, 1980, Ser. No. 177,990

Int. Cl.³ E06C 9/06

U.S. Cl. 182—47 **5 Claims**



1. An insulating cap for attic openings which receive disappearing staircases of the type in which a casement mounted in the attic opening supports a folddown staircase with the ladder portion of the staircase extending up into the attic area above the opening when said staircase is in the folded position, said cap comprising:

(a) a stationary rectangular frame formed substantially in its entirety of rigid insulative material having length and width dimensions greater than the corresponding dimensions of the opening in the attic floor; said frame including a pair of spaced sidewalls and a pair of spaced end walls secured together to form said rectangular frame, said side walls and said end walls being separate from said folddown staircase and when assembled surround said attic

opening to form a recess for receiving, but not supporting said staircase in the folded position;

(b) a cover member formed substantially in its entirety having length and width dimensions greater than said attic floor opening and removably supported by the upper surface of said rectangular frame;

(c) said rigid insulative material from which said frame and cover are formed having an R value of at least 19 through the thickness thereof;

(d) said cover being so positioned with respect to said rectangular frame that said cover is movable between a first normally closed position to a second open position providing access through said opening by a person standing on said staircase while said frame remains stationary.

4,344,506

ARRANGEMENTS FOR DRAINAGE OF LUBRICATING OIL FROM BEARING ASSEMBLIES

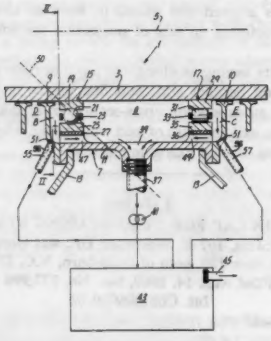
Stanley Smith, Bristol, England, assignor to Rolls-Royce Limited, London, England

Filed Feb. 25, 1980, Ser. No. 124,277

Claims priority, application United Kingdom, Mar. 5, 1979, 7907710

Int. Cl.³ F02G *7/06*

U.S. Cl. 184—6.11 **9 Claims**



1. A lubrication drainage system for draining lubricant which has collected in a chamber, said chamber encircling a shaft and enclosing a bearing on said shaft, said drainage system comprising:

a main drainage duct in said chamber disposed on one side of the bearing, a main scavenge pump pumping lubricant from said main drainage duct, auxiliary drainage ducting in the chamber disposed on the opposite side of the bearing to the main drainage duct, and means for the lubricant flowing through said auxiliary drainage ducting to bypass said scavenge pump.

4,344,507

SELF-LUBRICATING MACHINING APPARATUS

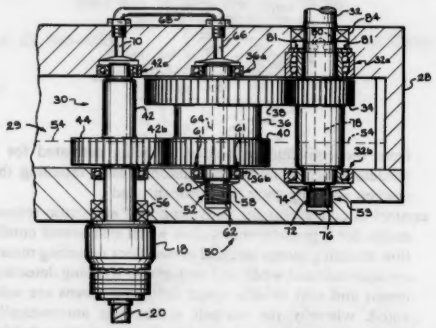
Robert L. Osborne, Mount Clemens, Mich., assignor to LaSalle Machine Tool, Inc., Troy, Mich.

Filed Nov. 27, 1979, Ser. No. 97,642

Int. Cl.³ F01M *9/00*

U.S. Cl. 184—6.18 **1 Claim**

1. In machining apparatus comprising a work-performing tool and transmission means for actuating said work-performing tool to machine a workpiece, a lubricating system for supplying lubricating fluid to select portions of said transmission means, said lubricating system comprising a housing in which said transmission means is located, said housing forming a reservoir in which lubricating fluid is contained, means forming a passage having an inlet in fluid communication with said reservoir to admit lubricating fluid into said passage, a rotatable threaded member disposed in said passage in close fitting relationship therewith and being operatively associated with said transmission means, and discharge conduit means in fluid communication with said passage and extending above the level of said lubricating fluid in said reservoir to a position where lubricating fluid can be supplied to said selected portions of said transmission means, said threaded member being rotatable in response to operation of said transmission means to force lubricating fluid from the reservoir through said discharge conduit means onto said selected portions of said transmission means, said transmission means including a rotary input shaft, at least one idler shaft and a spindle shaft on which said work-performing tool is mounted, and coacting means on said shafts for transmitting the rotation of said input shaft to said spindle shaft, bearing means including a plurality of bearing assemblies supporting said shafts for rotational movement, at least some of said bearing assemblies being located above the level of lubricating fluid in said reservoir, said passage means and said threaded member being operatively associated with



one of said shafts, said conduit means extending from said passage to a selected bearing assembly above said lubricating fluid to supply lubricating fluid thereto, said bearing assemblies including a spindle bearing assembly located above said lubricating fluid and supporting said spindle shaft, an idler bearing assembly supporting said idler shaft, and an input shaft bearing assembly, said conduit means being in fluid communication with said spindle bearing assembly whereby rotation of said input shaft forces lubricating fluid onto said spindle bearing assembly, said passage means and said threaded member being operatively associated with said idler shaft, said threaded member being an integral portion of said idler shaft, a second passage having an inlet in fluid communication with said reservoir and a second threaded member disposed in said passage in close fitting relationship therewith and being an integral portion of said input shaft, and second conduit means in fluid communication with said second passage and said input shaft bearing assembly whereby rotation of said input shaft causes the lubricating fluid to be forced through said conduit means to lubricate said bearing assemblies.

4,344,508

LIFT MECHANISM FOR A VEHICLE TAIL-BOARD OR OTHER LOAD PLATFORM

Albert W. Peck, Goldington, England, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Jul. 29, 1980, Ser. No. 173,337

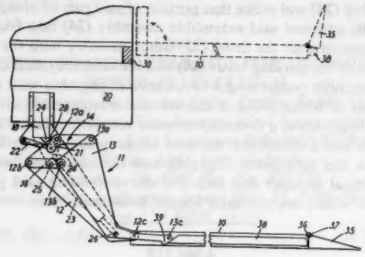
Claims priority, application United Kingdom, Aug. 3, 1979, 7927159

Int. Cl.³ B66B *9/20*

U.S. Cl. 187—9 R **9 Claims**

1. A lift mechanism for a load-carrying platform comprising at least one parallelogram linkage constituted by two main levers each having three non-colinear pivots and the pivots on the two levers defining substantially identical triangles, and the

levers being horizontally offset from each other in a direction towards and away from the platform, one pair of corresponding pivots on the two levers being respectively connected to the platform at two fixed points which are spaced apart a predetermined distance in the direction of the length of the platform, the pivots constituting the second pair being spaced apart by said predetermined distance and interconnected by a synchronising link, and the pivots constituting the third pair



being spaced apart by said predetermined distance and interconnected by a tilting lever, one of the pivots of the third pair having a fixed mounting on the vehicle, means for rotating the main levers about their respective pivots constituting the third pair, and means for selectively moving the tilting lever about the fixed mounting into a first position in which the pivots constituting the third pair are disposed one vertically above the other and into a second position in which the said pivots constituting the third pair are substantially in horizontal alignment.

4,344,509

FRICTION LINING WEAR INDICATORS FOR SHOE-DRUM BRAKES

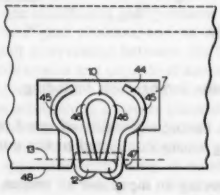
George A. Harmer, West Midlands, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jan. 29, 1980, Ser. No. 116,668

Claims priority, application United Kingdom, Feb. 15, 1979, 7905321

Int. Cl.³ F16D *66/02*

U.S. Cl. 188—1.11 **4 Claims**



1. A friction lining wear indicator for a brake shoe of a shoe-drum brake, said brake shoe including a platform having axial edges and a T-shaped depression formed in one of said axial edges by displacement of a portion of said one edge in a radial direction, and a friction lining carried by said platform for engagement with a rotatable drum, said friction lining wear indicator comprising a sensor mounted on said brake shoe, an indicating means adapted to be actuated when the thickness of said friction lining is less than a predetermined value, mounting means for mounting said sensor on said shoe, said mounting means comprising a resilient clip and said sensor comprising a loop of wire separate from said clip, said resilient clip being located in said T-shaped depression in said platform, and being so shaped as to co-operate with said shoe so that it is retained in said depression by its resilience in order to retain said sensor in a position of use adjacent said lining.

4,344,510

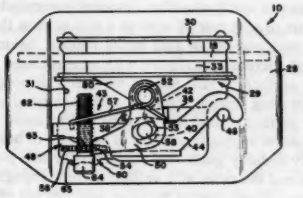
DISC BRAKE AND IMPROVED ADJUSTER THEREFOR

Donald D. Johannesen, and Andrew F. Kazmierzak, both of South Bend, Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Aug. 22, 1980, Ser. No. 180,290

Int. Cl.³ F16D *65/56*

U.S. Cl. 188—71.9 **4 Claims**



1. In a disc brake assembly comprising a frame formed of a continuous, movable plate member having a closed loop with a central opening receiving a pair of friction elements therein adjacent a rotor, an actuator operable during a brake application to urge the pair of friction elements into engagement with the rotor, an adjustment means cooperating with the frame and the pair of friction elements to maintain a running clearance between the rotor and the pair of friction elements, said adjustment means including a lever extending into the central opening and pivotally engaging said frame and including an extendible assembly cooperating with said lever and frame to control the pivotal movement of said lever, characterized in that a pawl is pivotally engaged with one of said pair of friction elements, said pawl engaging the lever and the extendible assembly so as to impart movement to said extendible assembly in response to movement of said one friction element, and said pawl being carried by said one friction element and said lever to substantially remain within the central opening in spaced relation to said frame.

4,344,511

FLOATING CALIPER-SPOT-TYPE DISC BRAKE

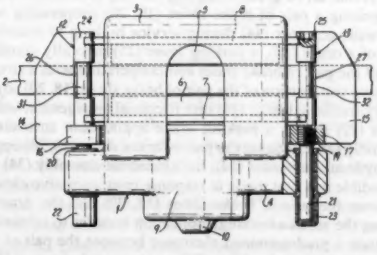
Roberto Stoka, Nauheim, and Ulrich Lötzsch, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 17, 1980, Ser. No. 130,960

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1979, 2916244

Int. Cl.³ F16D *65/14*

U.S. Cl. 188—73.45 **15 Claims**



1. A floating caliper-spot-type disc brake comprising:

a brake support disposed on one side of a brake disc having a pair of spaced arms parallel to the axis of rotation of said brake disc and extending over the edge of said brake disc,

said pair of arms each having an inner surface thereon facing one another;

a pair of brake shoes each disposed adjacent and parallel to a different side of said brake disc and having lateral supporting edges thereof adjacent and in opposing relationship to said inner surfaces of said pair of arms;

a brake caliper embracing the edge of said brake disc and said pair of brake shoes having in one leg thereof a brake actuating device abutting an adjacent one of said pair of brake shoes and the other leg thereof abutting the other of said pair of brake shoes; and

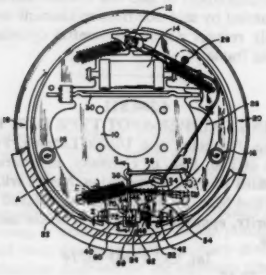
a pair of elongated cylindrical guide pins each parallel to said axis of said brake disc, detachably secured to a different one of said pair of arms in a mid section thereof adjacent said one leg of said brake caliper, having one end section thereof coextensive with an associated one of said inner surface of said pair of arms and disposed between and bearing against each of said associated one of said inner surface of said pair of arms and an associated one of said lateral supporting edges of said pair of brake shoes to axially slidably guide and support only said pair of brake shoes and the other end section thereof engaging a different one of two spaced bores in said one leg of said brake caliper to axially slidably guide said brake caliper at only said one leg thereof, said one end section of said pair of guide pins transmitting braking force from said pair of brake shoes to said pair of arms and said pair of brake shoes only partially encompass said pair of guide pins.

4,344,512

DUO SERVO DRUM BRAKE AND PARKING MECHANISM THEREFOR

Ji Y. Woo, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 20, 1980, Ser. No. 122,942
Int. Cl.³ F16D *51/20, 65/56*
U.S. Cl. 188—79.5 GE **3 Claims**



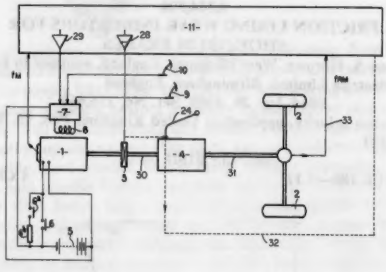
1. A duo servo drum brake and parking mechanism therefor comprising a pair of brake shoes (18, 20) cooperating with a hydraulic actuator (14) during service braking to retard rotation of a drum (22), a parking lever (26) pivotally coupled to one of the pair of brake shoes and cooperating with a strut (30) to move that portion of the pair of brake shoes (18, 20) adjacent the hydraulic actuator (14) into frictional engagement with the drum (72) during a parking brake application, an extendible assembly (24) engaging the pair of brake shoes (18, 20) opposite the hydraulic actuator (14), the extendible assembly (24) being extendible in a first mode in response to an excessive clearance between the pair of brake shoes (18, 20) and the drum (22) during the service braking application in order to substantially maintain a predetermined clearance between the pair of brake shoes (18, 20) and the drum (22), and connecting means (32, 36, 38) extending between the parking lever (26) and the extendible assembly (24), characterized by said connecting means including a cam (38) engageable with said extendible assembly, a link (32) pivotally carried by said parking lever (26) and a rod (36) connecting said cam (38) with said link (32), said extendible assembly (24) defining a pair of flanges (60, 62) forming a spacing therebetween for receiving said cam (38), said link (32) pivoting relative to said parking lever (26) during the parking brake application to bias said parking lever (26) to pivot relative to one of said pair of brake shoes and also to move said cam (38) relative to said extendible assembly via said rod (36), movement of said cam (18) relative to said extendible assembly (24) biasing said pair of flanges (60, 62) to separate from each other to define a second mode of extension for said extendible assembly (24) and move that portion of said pair of brake shoes (18, 20) adjacent said extendible assembly (24) into frictional engagement with the drum (22) simultaneously with the cooperation of the parking lever (26) and the strut (30), said extendible assembly comprising a first sleeve engageable with one of the pair of brake shoes, a second sleeve engageable with the other brake shoe, a threaded member rotatable relative to said sleeves and a cylindrical member telescoping into one of said sleeves and threadably engaging said threaded member, said cylindrical member and said one sleeve defining said pair of flanges which are normally spaced from each other.

4,344,513

TRANSMISSION MECHANISM COMPRISING A CLUTCH AND A GEAR BOX HAVING A PLURALITY OF SPEED RATIOS

Michel Etienne, Valmondois, France, assignor to Automobiles Peugeot and Societe Anonyme Automobiles Citroen, both of Paris, France

Filed May 30, 1980, Ser. No. 154,990
Claims priority, application France, Jun. 8, 1979, 79 14729
Int. Cl.³ B60K *41/28*
U.S. Cl. 192—.02 R **4 Claims**



1. A transmission arrangement including:

(a) a motor;

(b) a gear box having a plurality of speed ratios;

(c) a receiving means connected to the output of the gear box;

(d) a clutch having an input and an output, said input connected to said motor, said output connected to said gear box;

(e) means for detecting the actual speed of the motor;

(f) means for detecting the actual speed of the receiving means;

(g) means for altering the speed of the motor;

(h) a digital means for calculating the theoretical speed of the receiving means as a function of the actual speed of the motor as detected by said means for detecting the actual speed of the motor, and also as a function of the engaged speed ratio of the gear box;

(i) means for comparing said theoretical speed and the detected speed of the receiving means;

(j) means for connecting the output of the comparing means to the motor speed altering means;

(k) said digital calculating means including:

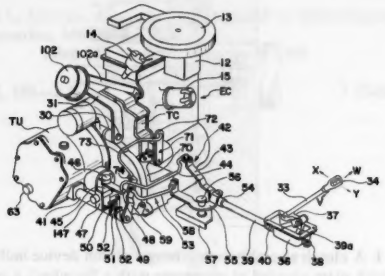
(l) a plurality of binary memories;
(m) a plurality of multiplexer means for obtaining, as a function of the engaged speed ratio, predetermined digital calculation co-efficients entered into the memories, the multiplexer means being connected to the memories;
(n) at least two binary multipliers, connected in series, for multiplying the signal corresponding to said actual speed of the motor by said calculation co-efficients, said multipliers being connected to said multiplexers and to said comparator.

4,344,514

ELECTRIC SWITCH APPARATUS FOR AUTOMOBILE POWER TRAIN CLUTCH

Youji Fujihara, Ikeda; Masami Shiba, Osaka; Toshio Hazama, Toyonaka, and Shozo Kito, Nagoya, all of Japan, assignors to Daihatsu Motor Co., Ltd., Osaka and Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, both of, Japan

Filed Aug. 15, 1980, Ser. No. 178,632
Claims priority, application Japan, Mar. 11, 1980, 55-31263
Int. Cl.³ B60K *41/00*
U.S. Cl. 192—3.58 **15 Claims**



1. An electric switch apparatus for use in association with an automotive power train including a manually shiftable transmission unit, which comprises a gearshift lever movable in first and second gear-shifting directions opposite to each other, said gearshift lever when moved in the first gear-shifting direction being shiftable to any one of different gear positions of one group and, when moved in the second gear-shifting direction, shiftable to any one of different gear positions of another group including a reverse gear position, and an automatically controlled clutch unit intervening between the transmission unit and an automobile engine and capable of assuming coupled and uncoupled positions one at a time, said clutch unit when in the coupled position establishing a power transmission between an automobile engine and the transmission unit and, when in the uncoupled position, interrupting such power transmission, said electric switch apparatus comprising, in combination:

an actuator means including an electromagnetic control electrically connected to a source of electric power and operable to bring the clutch unit into the uncoupled and coupled positions when the electromagnetic control is energized and deenergized, respectively;

a control circuit for selectively opening and completing an electric circuit between the electromagnetic control and the electric power source; and

a switching circuit including a stroke switch assembly and a knob switch assembly and operable to control the operation of the control circuit,

said stroke switch assembly including normally opened first, second and third switches, said first switch being closed in response to the movement of the gearshift lever in the first gear-shifting direction, said second switch being closed in response to the movement of the gearshift lever in the second gear-shifting direction and said third switch being closed in response to the movement of the gearshift lever in any one of the first and second gear-shifting directions, all of said first to third switches being connected in parallel to each other, and

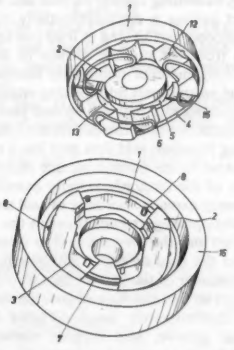
said knob switch assembly being incorporated in a manipulatable knob assembly mounted on the gearshift lever for pivotal movement in first and second switching directions opposite for each other and includes a normally closed fourth switch connected with the second switch, a normally closed fifth switch connected with the first switch and a normally closed sixth switch connected in series with the third switch, said fourth and sixth switches being opened in response to the pivotal movement of the knob assembly in the first switching direction resulting from the application of an external manipulative force required to move the gearshift lever in the first gear-shifting direction, said fifth switch being opened in response to the pivotal movement of the knob assembly in the second switching direction resulting from the application of another external manipulative force required to move the gearshift lever in the second gear-shifting direction.

4,344,515

CLAW CLUTCH

Hugo Grote, Wetter; Heinz Hasselmann, Hagen; Volkmar Kunze, Wetter; Karl Zacharias, Schwerte; Robert Küelpmann, and Paul Mueller, both of Wetter, all of Fed. Rep. of Germany, assignors to Mannesmann DeMag AG, Duisburg, Fed. Rep. of Germany

Filed Apr. 2, 1980, Ser. No. 136,665
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1979, 2913483; Dec. 1, 1979, 2948430; Dec. 1, 1979, 2948431
Int. Cl.³ F16D *11/04*
U.S. Cl. 192—67 R **22 Claims**



1. In a claw clutch of the type having opposed clutch halves, each having angularly distributed, axially projecting claws, and generally cylindrical elastic bumpers positioned between adjacent claws of the respective clutch halves, the improvement characterized by

(a) said clutch halves being formed of die-cast aluminum,
(b) the base areas of the respective claws being of rounded contour generally corresponding to the cylindrical contours of said elastic bumpers; and
(c) said clutch halves include an outer retaining ring and an inner guide ring connecting said claws and confining said elastic bumpers therebetween, said claws projecting beyond said outer retaining ring and inner guide ring.

4,344,516

DISENGAGING DEVICE

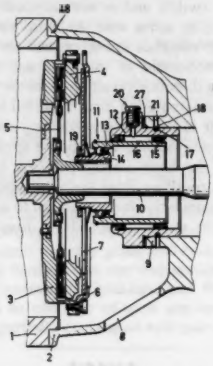
Dieter Kolb, Bad Kissingen, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Apr. 11, 1980, Ser. No. 139,586

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1979, 2915989

Int. Cl.³ F15B *21/00*; F16B *21/14, 21/16*

U.S. Cl. 192—114 R **5 Claims**



1. Disengaging device for a friction clutch to be attached to the motor of a vehicle, the friction clutch including a rotating member to be displaced in the axial direction along the axis of rotation of the rotating member for disengaging the clutch, a gear case, and means extending between said rotating member and said gear case for providing a connection therebetween, said means including a releasable locking connection, wherein the improvement comprising that said connection means comprises a first part coaxial with the axis of rotation of said rotating member, a second part coaxial with the axis of rotation and laterally enclosing said first part, said second part have a circumferentially extending outside surface and inside surface and said first part having a circumferentially extending outside surface, said second part having at least one opening extending therethrough from the outside surface to the inside surface thereof, a locking member removably insertable through the opening in said second part into locking engagement with said first part for locking said first and second parts against relative movement therebetween in the direction of the axis of rotation of said rotating member, said first part has a circumferentially extending groove in the outside surface thereof extending for at least a part of the circumferentially extending outside surface, said opening extends chordally of said second part so that a portion of the opening extends through the inside surface of said second part and the least dimension from the axis of said second part to the base of said opening being approximately equal to the diameter of the base of the circumferential groove in said first part so that the base of the opening in said second part extends approximately tangentially of the base of said circumferential groove, said locking member comprises a locking clamp having a pair of substantially parallel legs and a bight portion extending transversely between and interconnecting one end of each of said legs, a pair of said openings located on diametrically opposite sides of said second part, each of said legs of said locking clamp being guided through a different one of said openings in said second part and extending into the portion of said openings which open through the inside surface of said second part into the circumferential groove in said first part, wherein each of said legs at the opposite ends from the bight portion are bent inwardly toward one another forming a curved portion so that in the locked position the inwardly bent ends of said legs engage the outside surface of said second part for securing said clamp in the locked position, projections being formed on said second part and each said projection extending over and being located outwardly from one end of one of said openings through said second part, and the ends of said legs spaced from the ends connected to said bight portion being bent into a hook shape so that each hook-shaped end engages one of said projections when said clamp is displaced into the locked position for securing said clamp in the locked position.

4,344,517

CLUTCH RELEASE DEVICE

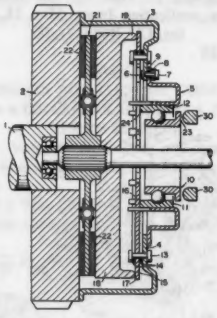
Takeshi Nakamura, Hiratsuka, and Akihiko Tanaka, Fujisawa, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1980, Ser. No. 171,252

Claims priority, application Japan, Aug. 24, 1979, 54-115892[U]; Sep. 27, 1979, 54-132624[U]

Int. Cl.³ F16D *23/14*

U.S. Cl. 192—98 **5 Claims**



1. A clutch assembly comprising a clutch device including a clutch plate adapted to cooperate with a fly-wheel, a pressure plate, and a clutch cover fixed to the fly-wheel to cover the clutch plate and the pressure plate; a clutch release device including a release bearing; holding means for the release bearing connected to the clutch device; and a self-centering means compensating for eccentricity between the clutch device and the clutch release device and for holding the clutch release device in a self-centered position, the self-centering means being provided between the clutch device and the holding means so that the clutch release device and the holding means may be moved together to the self-centered position.

4,344,518

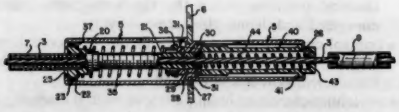
SELF-ADJUSTING CABLE CONDUIT MECHANISM

William J. Gilmore, Manitou Beach, Mich., assignor to Acco Industries Inc., Trumbull, Conn.

Filed Sep. 22, 1980, Ser. No. 189,362

Int. Cl.³ F16D *13/75*

U.S. Cl. 192—111 A **4 Claims**



1. A self-adjusting cable conduit mechanism for automatically compensating for wear in a control cable system where the system includes a movable control cable adapted to connect a controlled member with an actuation member; the improvement comprising in having a housing adapted to be anchored with respect to said control cable, a first cable conduit surrounding said control cable having an end terminating in

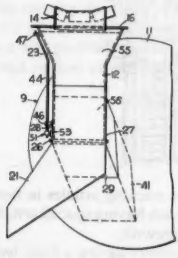
said housing and adapted to extend from said housing towards said controlled member, a serrated portion on the end of said first cable conduit within said housing, a spring activated locking means within said housing adapted to engage and lock with said serrated portion to limit movement of said first cable conduit into said housing, a first spring means operatively positioned between said first cable conduit and said locking means to urge said locking means into locking engagement with said serrated portion, locking release means adapted to be operatively positioned between said actuation member and said locking means, second spring means operatively positioned between the end of said first cable conduit and said locking release means for urging said first cable conduit outwardly of said housing towards said controlled member whereby when said locking release means is moved by said actuation member against the force of said first and second springs, said locking means will unlock to allow the first cable conduit to move with respect to said housing under the influence of said second spring means to adjust its effective length with respect to said control cable.

4,344,519

AUTO-SAMPLER AND FEED CHUTE FOR AN ASPHALT PLANT

Donald L. Murray, Appleton, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jul. 11, 1980, Ser. No. 167,405
Int. Cl.³ B65G *65/32*
U.S. Cl. 193—2 R **7 Claims**



1. A sampler feed chute assembly for an asphalt plant having a mixing drum and an aggregate conveyor for supplying said mixing drum with aggregate, said assembly comprising:

a feed chute **(12)** for receiving the aggregate from the conveyor;

a discharge chute **(41)** having an inlet **(56)** operatively connected to said feed chute to communicate with the interior of said feed chute to direct the aggregate into said drum mixer; and said feed chute having a bottom wall **(55)** defining a sampler discharge opening **(33)**;

a sampler chute **(21)** connected to said feed chute to enclose said sampler discharge opening and establish feed flow communication from the interior of said feed chute to said sampler chute to receive aggregate from said feed chute;

a selectively operable diverter means **(23)** within said feed chute operable to be moved to a first stationary position in which said diverter means closes said sampler discharge opening and directs the flow of aggregate to said discharge chute, and operable to be moved to a second stationary position in which said diverter means closes said discharge chute inlet **(56)** and diverts the aggregate to said sampler chute;

means for selectively moving said diverter means between said first and second stationary positions; and

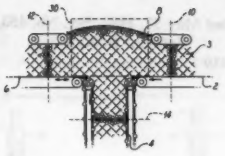
whereby the aggregate flowing from said feed chute into the drum mixer may be selectively diverted to said sampler chute for obtaining a representative sample of the aggregate flowing through said feed chute.

4,344,520

MONITORING FLOW OF ROD-LIKE ARTICLES

Jerzy W. Czoch, and Douglas J. W. Seagrove, both of London, England, assignors to Molins Limited, London, England

Continuation of Ser. No. 872,872, Jan. 27, 1978, abandoned. This application Feb. 26, 1980, Ser. No. 124,802
Claims priority, application United Kingdom, Feb. 5, 1977, 4856/77
Int. Cl.³ B65G *1/04*
U.S. Cl. 198—347 **34 Claims**



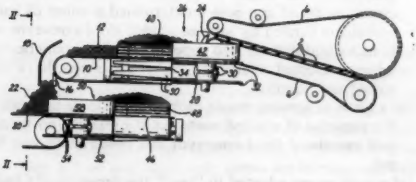
1. Apparatus for monitoring the flow conditions of cigarettes or similar rod-like articles moving as a multilayer stack in a conveyor stream, comprising sensor means arranged adjacent the ends of said articles for detecting the presence of those articles appearing along at least one line extending substantially over the height of the stack transverse to a direction of movement of said stack; electrical circuit means for repeatedly scanning said sensor means so as to produce an electrical signal representative of the articles appearing along said line; and processor means responsive to said electrical signal for producing an output signal indicative of the quantity of said articles which passes said sensor means per unit time.

4,344,521

APPARATUS FOR CONVEYING ROD-LIKE ARTICLES

David S. Bennett, and Grantley R. Hoath, both of High Wycombe, England, assignors to Molins Limited, High Wycombe, England

Filed May 21, 1980, Ser. No. 151,984
Claims priority, application United Kingdom, May 22, 1979, 7917752
Int. Cl.³ B65G *15/00, 47/24, 47/12*
U.S. Cl. 198—404 **12 Claims**



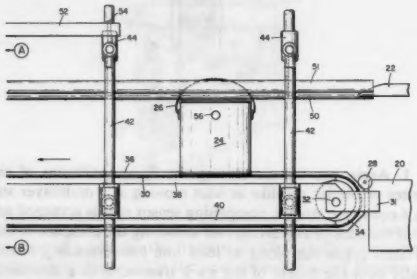
1. Apparatus for conveying rod-like articles, comprising conveyor means for conveying first and second streams of rod-like articles in generally parallel directions transverse to the lengths of the articles, the articles in one stream having corresponding ends at one side of the stream relative to its direction of movement and the articles in the other stream having corresponding ends at the other side of the stream relative to its direction of movement, and transfer conveyor means for conveying articles from at least one stream to a position at which articles from both streams are formed into a

combined stream in which corresponding ends of the articles are all at the same side of the stream, the transfer conveyor means including two transfer conveyors arranged in sequence with a down-drop disposed therebetween to move articles in stack formation in a direction transverse to their lengths on two separate generally horizontal curved paths at different levels respectively in opposite directions about axes generally perpendicular to said directions and to articles on said paths.

4,344,522
APPARATUS FOR SENSING, ORIENTATING AND DELIVERING CANS TO SUBSEQUENT CONVEYOR

Raymond A. Heisler, 657 Dakota Trail, Franklin Lakes, N.J. 07417

Filed May 27, 1980, Ser. No. 153,069
Int. Cl.[3] B65G 47/26
U.S. Cl. 198—419 5 Claims



1. A bailed container merge apparatus and stop means adapted to receive bailed containers with the affixed bails carried in a substantially vertical manner, said merge apparatus and stop means including:

(a) means for advancing bailed containers from plural first conveyors and to merge these bailed containers into a single file array on a second conveyor whereat they are advanced;

(b) metering apparatus for receiving the single file array of advancing containers carried on said second conveyor and alternately feeding these bailed containers to and onto a pair of like third conveyors and with each of said third conveyors travelling at substantially like speeds;

(c) a timing circuit disposed to initiate a signal to a first pin, said first pin movable from a non-engaging condition to a condition where said first pin is moved so as to come in way of advancing bailed containers on an associated third conveyor, and means provided in and by said timing circuit to count and pass a determined number of bailed containers carried by said associated third conveyor and to move said first pin into impeding condition and position when a selected number of bailed containers have been passed and counted;

(d) a series of sensing means each adapted to be actuated by the presence of a bailed container at a selected position on said associated third conveyor and upstream of said first pin;

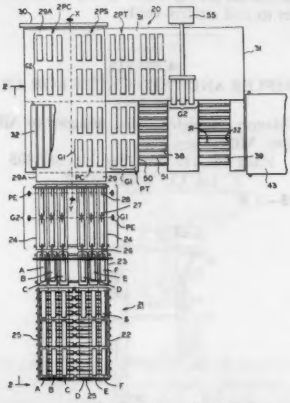
(e) circuit means adapted to "read" the presence of a bailed container at each of said sensing means and to evaluate the period of time in which the containers are in way of the associated sensing means, and after a selected duration of time an actuating signal is sent to a container stop means upstream of said second conveyor, the actuating signal causing the stop means to be actuated, and when the time duration is less than said selected duration the stop means is not actuated, and

(f) a pair of second pins providing said container stop means, said pair of second pins arranged so that each is adapted to be brought in way of a lower rim of an advancing bailed container as said bailed container is advanced along said first conveyors while maintaining the attached bail in a substantially vertical attitude, this pair of second pins reciprocated from and in way of an advancing container and in response to the actuated signal from the circuit means.

4,344,523
APPARATUS FOR ACCUMULATING AND STACKING ARTICLES

Kenneth D. May, Buffalo Grove, and John T. Bell, St. Charles, both of Ill., assignors to Container Corporation of America, Chicago, Ill.

Filed Apr. 14, 1980, Ser. No. 139,853
Int. Cl.[3] B65G 47/26
U.S. Cl. 198—424 3 Claims



1. A conveyor for stacking articles in tiers comprising:

(a) a conveying reach having spaced article conveying carriers movable therewith;

(b) each of said carriers having a front wall and a rear wall, the front wall being shorter than the rear wall;

(c) each of said walls having slots therein, the slots in the front wall being aligned with like slots in the rear wall;

(d) stationary ramp members extending into said slots and providing support and guidance for a group of articles to be arranged in stacks in said carriers;

(e) each ramp member having a holding surface for a group of articles while an adjacent group is moving along another surface for deposition of the articles into the carrier;

(f) other ramp members disposed in a position in the direction of movement of the conveying reach and having a holding surface for a second group of articles positioned to be engaged by the rear wall of a carrier and to be deposited upon the articles already placed in said carrier.

3. An apparatus for accumulating and stacking articles comprising:

infeed conveyor means having a plurality of lanes thereon for moving the articles in end-to-end relationship;

first sensing means for sensing the presence of articles in said plurality of lanes of said infeed conveyor means;

first endless conveyor means having a conveying reach disposed upon a support surface responsive to said first sensing means for receiving a portion of a group of said articles from said infeed conveyor means and for moving same in the end-to-end relationship to a first position on said first endless conveyor means;

second sensing means for sensing the presence of articles in said first position on said first endless conveyor means;

second endless conveyor means being responsive to said second sensing means and moving transversely to said

infeed and first endless conveyor means, said second endless conveyor means having article engaging flights for moving the group portion to a second position on said first endless conveyor means, said second endless conveyor means being indexed to move said groups of articles to successive positions on said support surface;

said infeed and first endless conveyor means moving the remaining portion of the group of said articles to a position on said first endless conveyor means adjacent to the group portion for subsequent movement by said second conveyor means to a position on said first endless conveyor means spaced from the position adjacent said group portion on said first endless conveyor means;

endless carrier conveyor means being operable in a timed relation with respect to said second conveyor means, said endless carrier conveyor means being disposed beneath said support surface for receiving said remaining group portion from a position on said support surface and for subsequently receiving the group portion of said articles from a position on said support surface so that said articles are placed in said endless carrier conveyor means and stacked in tiers;

separating means disposed on said support surface including first openings to receive the groups for placement on said endless carrier means as a lower tier of the stack and second openings to receive the remaining groups for placement on said endless carrier means as an upper tier of the stack; and

actuating means for moving the group portion into a position of alignment with said remaining group portion for subsequent movement into position of said second openings for placement on said endless carrier means.

4,344,524

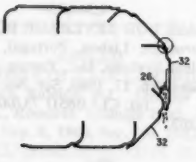
FINES REMOVAL IN HORIZONTAL COOLERS

Glenn H. Falck, and James R. Boose, both of Montgomery, Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Aug. 21, 1980, Ser. No. 180,160

Int. Cl.³ B65G *17/32, 45/00*

U.S. Cl. 198—494 **20 Claims**



11. Apparatus for removing fines from a foraminous, endless conveyor having a load run, a return run, a discharge end and a turn-around end which collectively define the conveyor path and its interior and exterior periphery and in which said apparatus is adapted to remove fines that fall through said load run and accumulate on said return run, said apparatus comprising:

means to collect said fines on said return run and to convey said collected fines on said load run to the discharge end of the conveyor; and

means to permit passage of said collected fines through said conveyor at said discharge end.

4,344,525

SCRAPER DEVICE

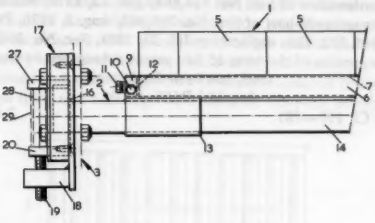
John Bancroft, Blackburn; John L. Greenhalgh, Accrington, and Ronald Smith, Oswaldtwistle, all of England, assignors to J. H. Fenner & Co. Ltd., Hull, England

Filed Aug. 13, 1980, Ser. No. 177,551

Claims priority, application United Kingdom, Aug. 15, 1979, 7928410

Int. Cl.³ B65G *45/00*

U.S. Cl. 198—499 **14 Claims**



1. A scraper device for a conveyor belt, comprising: a support unit including an elongate bar, a scraper blade mounted on said bar, a framework comprising a pair of longitudinally spaced slide blocks apertured to rotatably receive ends of the elongate bar, means for resiliently loading said slide blocks, and a shear connection between the support unit and framework to resist relative rotation therebetween until excessive torque is applied to the scraper blade.

4,344,526

TOBACCO STREAM BUILDING CHANNEL FOR USE IN CIGARETTE ROD MAKING MACHINES OR THE LIKE

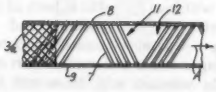
Guido Quarella, Escheburg, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 909,535, May 25, 1978, abandoned. This application Aug. 1, 1980, Ser. No. 174,539

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1977, 2727572

Int. Cl.³ B65G *15/28*

U.S. Cl. 198—689 **7 Claims**



1. In a machine for producing a stream of tobacco or other particulate material, the combination of an elongated channel having two spaced-apart side walls and an air-permeable third wall between said side walls, said third wall having a first and a second side; a suction chamber adjacent to one side of said third wall; an endless foraminous belt having a stretch adjacent to the other side of said third wall; means for moving said belt lengthwise in a predetermined direction, said belt having filaments extending substantially at right angles to said direction; and means for feeding particulate material into said channel whereby the material is attracted to and transported by said stretch in said direction, said third wall comprising alternating first and second portions extending between said side walls and each including at least one elongated substantially rod-shaped member, said members extending between said side walls and each making an oblique angle with said predetermined direction and with said filaments, the inclination of members of each first portion being opposite to the inclination of members of each second portion and each of said members having a front

end and a rear end, as considered in said direction, the front and rear ends of each member of each first portion being respectively adjacent to one of said side walls and the opposite side wall, and the front and rear ends of each member of each second portion being respectively adjacent to said opposite side wall and said one side wall.

4,344,527

ROLLER CONVEYOR WITH FRICTION ROLL DRIVE

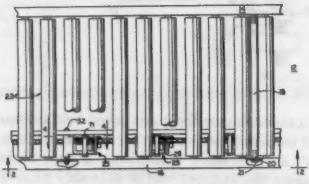
Robert K. Vogt, and Martin A. Heit, both of Cincinnati, Ohio, assignors to The E. W. Buschman Company, Cincinnati, Ohio

Continuation of Ser. No. 914,851, Jun. 12, 1978, which is a continuation-in-part of Ser. No. 710,442, Aug. 2, 1976, Pat. No. 4,108,303. This application Jul. 22, 1981, Ser. No. 284,760

The portion of the term of this patent subsequent to Aug. 22, 1995, has been disclaimed.

Int. Cl.³ B65G *13/06*

U.S. Cl. 198—781 **2 Claims**



1. A live roller conveyor of the type including a frame, a plurality of rollers mounted in said frame, and drive means for at least some of said rollers, wherein said drive means comprises

a plurality of separate power transmission devices each including a supporting assembly having rotationally mounted therein a drive unit including a drive wheel and a driving sprocket therefor,

means mounting said assembly on said frame for movement between a retracted non-driving position and a position of driving relation between said drive wheel and at least one of said rollers,

a flexible drive chain including a driving run extending below and in driving engagement with all of said sprockets,

a chain retaining member forming a part of each said movably mounted assembly in underlying relation with the associated said sprocket for retaining said chain in driving engagement with said sprocket in both of said driving and retracted positions of said assembly, and

means forming a separable connection between each said chain retaining member and another part of the associated said assembly wherein said drive unit is supported to effect release of the associated said sprocket from said chain.

4,344,528

PROJECTILE LOCK ASSEMBLY

Ayyala Perisastry, Dover; Richard A. Vishe, and Peter J. Hoet, both of York, all of Pa., assignors to Harsco Corporation, Camp Hill, Pa.

Filed Oct. 23, 1980, Ser. No. 200,093

Int. Cl.³ F42B *37/00, 39/00*

U.S. Cl. 206—3 **20 Claims**

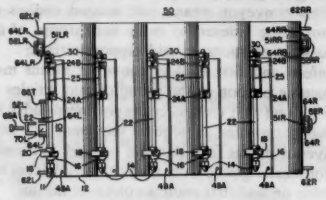
1. A locking assembly for securely holding an elongated article within an associated cylindrical tube comprising:

a cylindrical tube defining an interior space and an axial center line;

a control rod extending lengthwise parallel to the center line of said cylindrical tube and selectively rotatably disposable in a locked position and an unlocked position;

a shoe assembly including an engagement surface;

and a camming surface cooperating with said control rod and said shoe assembly; whereby rotation of said control rod to a locked position moves said engagement surface of said shoe assembly towards said interior space, said engagement surface thereby serving to clamp and friction-



ally secure one of said elongated articles whenever such article is disposed within said cylindrical tube.

4,344,529

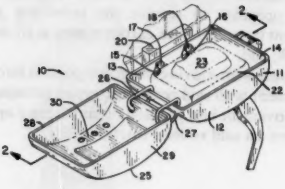
COMBINED SOAP HOLDER AND PRESS

Joe A. Ibarzabal, 15546 Chase St., #18, Sepulveda, Calif. 91343

Filed Jan. 19, 1981, Ser. No. 225,869

Int. Cl.³ A47K *5/08*

U.S. Cl. 206—77.1 **10 Claims**



1. A combined soap holder and soap press for use in saving soap pieces by reforming remnants with a new soap bar comprising the combination of:

a base dish for holding a soap bar and remnants;

a lid hingably coupled to one end of said base dish;

cam means operably carried on said base dish for bearing against said lid to forcibly urge said lid to compress said soap bar and remnants together into a unity soap cake; and

means carried on said end of said base dish hingably connected to said lid for supporting said lid in a side-by-side relationship with said base dish so as to serve as an additional holder when not in use as a soap press.

4,344,530

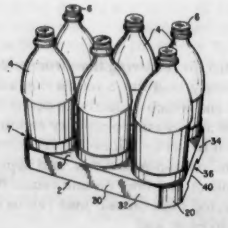
CASE FOR BEVERAGE BOTTLES

Pierre J. deLarosiere, Lisbon, Portugal, assignor to International Container Systems, Inc., Tampa, Fla.

Filed Sep. 17, 1980, Ser. No. 188,252

Int. Cl.³ B65D *75/00*

U.S. Cl. 206—203 **12 Claims**



1. A case for transporting bottles, the bottles having a longi-

tudinal symmetry axis and having a top closure for sealing the bottle and a base portion contoured to permit the bottle to stand on a flat surface, the base portion having a bottom which contacts the surface on which the bottle stands, the bottom being defined generally between an outer wall of the base portion of the bottle and an indentation in the base portion, the case being molded from a plastic material and comprising:

(a) an outer shell;

(b) a plurality of support elements connected to and generally disposed within the outer shell for reinforcing the shell, the outer shell and support elements being shaped to define a plurality of bottle pockets, a square lattice of vertex points being defined in fixed geometric relationship to the outer shell, the bottle pockets being located at vertex points of squares of the lattice, the outer shell being shaped relative to the lattice of vertex points to permit a plurality of such cases with bottles inserted in the bottle pockets to be arranged in a multilayered cross-stacked structure;

(c) bottle seating means associated with each of the bottle pockets for orienting and supporting bottles inserted into the pockets, each bottle seating means including:

(c.1) a bottle side-wall gripper connected to at least one of the outer case and the support elements, the gripper being configured to grip a radially outer wall of a base portion of a bottle inserted in the bottle pocket to position the bottle, and

(c.2) a bottle base support connected to at least one of the outer case and the support elements, the bottle base support being spaced apart along a pocket centerline from the bottle side-wall gripper, the bottle base support being positioned and configured to fit within the indentation in the base portion of a bottle inserted into the bottle pocket to support the bottle and, in cooperation with the bottle side-wall gripper, to orient the bottle so that the symmetry axis of the bottle substantially coincides with the pocket centerline; and

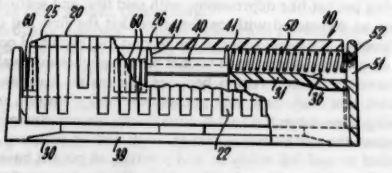
(d) stacking/cross-stacking case rests associated respectively with each of the bottle pockets, each case rest being connected to one of the outer shell and the support elements and located generally coaxially with respect to the pocket centerline spaced apart from the bottle base support in a direction opposing the corresponding bottle side-wall gripper, each case rest being configured to locate a closure of a bottle oriented generally coaxially with the pocket center line, so that cases of bottles can be stacked one on top of the other with the bottles of a lower case being positioned and oriented by the bottle seating means of the lower case to locate the closures of the bottles within the stacking/cross-stacking case rests of an upper case, weight of the upper case thereby being transmitted to closures of bottles in the lower case by way of case rests of the upper case.

4,344,531

HEMOSTATIC CLIP CARTRIDGE

Robert V. C. Giersch, Raleigh, N.C., assignor to Edward Weck & Company, Inc., Research Triangle Park, N.C.

Filed Sep. 8, 1980, Ser. No. 185,095
Int. Cl.³ B65D *83/00, 85/24, 85/62*
U.S. Cl. 206—339 **4 Claims**



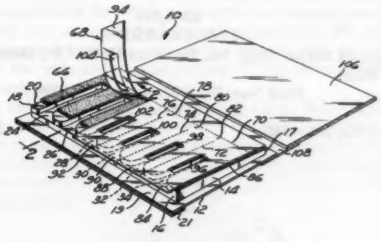
1. A clip cartridge adapted to contain hemostatic clips in serial arrangement comprising a cover, a base including a track connecting front and rear end walls of said base, said track shaped to accommodate said clips in serial arrangement thereon and permit said clips to be moved along said track toward the front end wall of said base, a slider shaped to fit on said track and adapted to move along said track, and means to bias said slider toward the front end wall of said base; said cover having an inside surface contoured to fit on said base and over said track to enclose said track for a major part of track length in a manner retaining said clips and said slider on said track while permitting said clips and said slider to move on said track, said cover being positioned on said base to provide a delivery station at an unenclosed portion of said track between outside surface of forward end of said cover and inside surface of front end wall of said base to permit removal of individual clips from said cartridge by a separate retrevial device.

4,344,532

SURGICAL BLADE REMOVER

John D. Eldridge, Jr., Balboa Island, and Milton W. Cohen, Orange, both of Calif., assignors to Instranetics, Inc., Tustin, Calif.

Filed Aug. 11, 1980, Ser. No. 177,123
Int. Cl.³ B65D *83/10*
U.S. Cl. 206—370 **19 Claims**



1. A device for removing a blade having an opening therethrough from a tang of a blade holder, said tang having an upraised projection which extends through said opening to mount said blade on said tang comprising:

a support surface for supporting a blade flat against said surface;

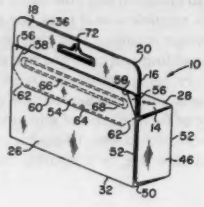
means defining an elongate channel open to said support surface and extending a substantial distance along said support surface, said channel being open at one end and having a width less than the width of said blade and more than the width of said tang, said channel being of sufficient depth to receive said tang with the end of said projection toward said channel open end disposed below said support surface while said blade is held flat against said support surface to permit said tang to be pressed down and pivoted away from said support surface and thereby released from said blade,; and

means for holding the blade against said support surface when the tang is placed in said channel and pulled longitudinally relative to the blade out the open end of the channel after the blade is released from the tang but remains flat on said support surface.

4,344,533
FIFTH PANEL RECLOSABLE PACKAGE

Peter R. Olsen, Suffern, N.Y., assignor to Grinnell Lithographic Co., Inc., Islip, N.Y.

Filed Jul. 28, 1980, Ser. No. 172,537
Int. Cl.[3] B65D *5/54, 5/64*
U.S. Cl. 206—459 20 Claims

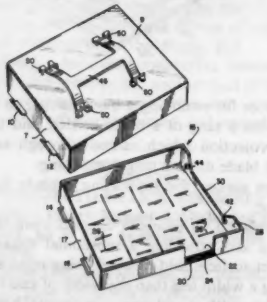


1. A package comprising connected front, bottom, rear and top panels and side flaps to form a closed compartment,
a fifth panel comprising front and rear members extending upward from said top and rear panels,
an instruction panel integral with one of said panels and extending downward into the interior of and contained within said closed compartment,
a removable strip connected with one of said panels to complete the closure of said compartment,
said removable strip being separable from said one of said panels to open said compartment and to expose to view said instruction panel,
and said exposed instruction panel, when being exposed to view, obstructs access to said compartment to require the instructions on said instruction panel to be viewed before removing contents from said compartment.

4,344,534
PIZZA CARRIER

Bernard Sutton, Bldg. No. 10, Glenn Hollis Cir., Decatur, Ga. 30034

Filed Nov. 28, 1980, Ser. No. 211,466
Int. Cl.[3] B65D *11/10*
U.S. Cl. 206—545 3 Claims

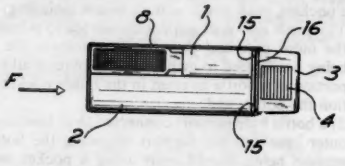


1. An insulated hot food carrier for hot pizza and other hot foods in a hot or warm state; comprising a tray having a front wall and a rear wall and side walls, an outer bottom wall and an inner bottom wall spaced from the outer bottom wall, a heat insulating substance interposed between said outer and inner bottom walls, a cover provided with insulating means for enclosing said tray, means for detachably securing said cover in intimate engagement with said tray and means for carrying said carrier detachably secured to said cover, said cover insulating means comprises a chamber formed by inner walls spaced from said outer walls and heat insulating materials in said chamber, said means for detachably securing said cover to said tray consists of a pair of leaf springs secured to one said tray consists of a pair of leaf springs secured to one side of said cover with one end, a pin secured to the free end of each of said leaf springs said pin normally extending through aligned holes in an outer side wall, adjacent inner walls of said chamber and said tray, said means for securing said cover to said tray further including a pair of hooks secured to the rear wall of said cover and engageable with extending from the rear wall of said tray.

4,344,535
POCKET ACCESSORY FOR ORAL HYGIENE

Ernesto Cagnazzi, Monza, Italy, assignor to Meka S.N.C. di P. Merati & C., Monza, Italy

Filed Jun. 19, 1980, Ser. No. 160,878
Claims priority, application Italy, Jun. 20, 1979, 21901/79[U]
Int. Cl.[3] B65D *69/00;* A44D *44/18;* A63H *27/00;* A46B *11/00*
U.S. Cl. 206—581 7 Claims

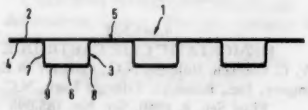


1. A pocket accessory for oral hygiene comprising, a case open at one end, a single support element slidable in said case, a pocket tooth-brush and a pocket dentrifice container each projecting from one end of said support, said support element, when said brush and container are introduced into said case, being adapted to constitute a closure element of said open end of said case, and said support element, when said brush and container are in the withdrawn position, being adapted to be inserted into said open end of said case, said case forming a handle of the accessory.

4,344,536
AIR CUSHION FOIL FOR PACKAGING PURPOSES

Dieter Oberhuber, 8000 Me,uml/u/ nchen 40, BRD, Stengelstrasse 1, Fed. Rep. of Germany

Filed May 15, 1980, Ser. No. 150,036
Claims priority, application Fed. Rep. of Germany, May 21, 1979, 7914659[U]
Int. Cl.[3] B65D *81/14, 85/30*
U.S. Cl. 206—594 7 Claims



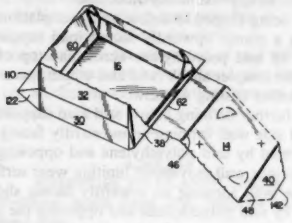
1. Air cushion foil, suitable for packaging purposes, comprising a first smooth foil of synthetic material and a second foil having pocket-like depressions; with said first and second foils being so connected with one another that the first foil closes the pocket-like depressions of the second foil; each said pocket-like depression comprises a pocket base, a pocket side wall and a curved transition region between the pocket base and the pocket side wall, each said pocket base and transition region having been subjected to a corona discharge pre-treatment to increase the microsurface area thereof; and an adhesive layer applied to said foil solely to said pre-treated pocket bases and transition regions whereby the entire adhesive layer is strongly adhered to said foil.

4,344,537

EXPANDABLE CARTON AND BLANK FOR FORMING SAME

John J. Austin, Elkhart, Ind., assignor to Champion International Corporation, Stamford, Conn.

Filed Feb. 27, 1980, Ser. No. 125,153
Int. Cl.³ B65D 17/20, 17/24
U.S. Cl. 206—611 11 Claims



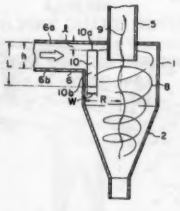
1. An expandable carton, comprising:
a top panel having first and second side edges and first and second end edges;
a bottom panel having first and second side edges and first and second end edges;
self-locking expandable means for coupling said first and second side edges and said first end edge of said top panel to said first and second side edges and said first end edge of bottom panel, respectively;
a bottom closure flap hingedly coupled to said bottom panel at said second end edge thereof along a fold line; and
a top closure flap hingedly coupled to said top panel at said second end edge thereof along a fold line.

4,344,538

CYCLONE SEPARATOR WITH INFLUENT GUIDE BLADE

Tetsuo Fujisawa, Kobe, and Takashi Tanioka, Osaka, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed May 22, 1981, Ser. No. 266,176
Claims priority, application Japan, Jun. 11, 1980, 55-82184[U]; Jul. 16, 1980, 55-98123
Int. Cl.³ B04C 5/04, 5/103
U.S. Cl. 209—144 4 Claims



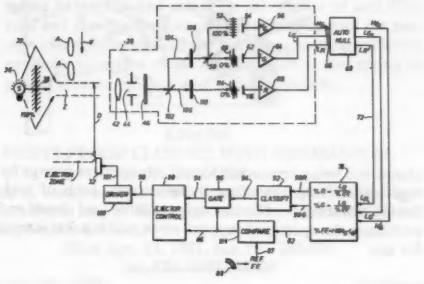
1. A cyclone separator for separating or collecting solid particles from a fluid, comprising:
a vertically disposed straight cylindrical portion having an inlet duct for introducing thereinto a fluid in a circumferential or tangential direction and receiving an exhaust duct through the top or ceiling wall thereof;
a separating portion of inverted conical shape formed contiguously below the straight cylindrical portion and having an outlet for separated particles at the converged bottom thereof; and
an influent guide blade projected into said straight cylindrical portion of said cyclone along an extension line of the inner side wall of said inlet duct and having a width of 0.1 to 0.5 in dimensional ratio to the radius of said straight cylindrical portion, the upper end of said influent guide blade being located at a position lower than the ceiling wall surface of said inlet duct by a distance of 0.05 to 0.5 in dimensional ratio to the height of said inlet duct.

4,344,539

UNIVERSAL SORTING APPARATUS

James F. Lockett, 7410 Tours, Houston, Tex. 77036

Filed May 5, 1978, Ser. No. 903,050
Int. Cl.³ B07C 5/342
U.S. Cl. 209—564 63 Claims



1. Apparatus for sorting articles comprising:
a viewer element adapted to view a viewed zone through which an article to be sorted passes;
an electrical signal generator arrangement associated with the viewer element and adapted to respond to light energy incident thereon to generate a first and a second electrical signal representation of the light energy reflected from the same portion of the article to be sorted as detected against a first and a second background respectively, the first background having a reflectivity characteristic greater than the reflectivity characteristic of the second background; and,
means for generating a third electrical signal functionally related to the difference between the signal representations of reflected light energy as detected against the first and second backgrounds, the third electrical signal being representative of the portion of the viewed area occupied by the article.

4,344,540

DISPLAY DEVICE

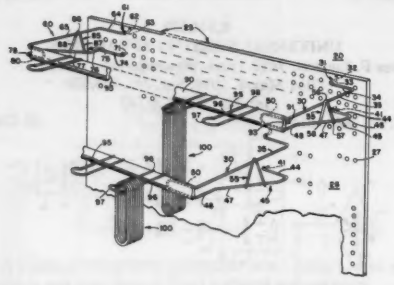
Howard J. Marschak, 865 W. North Ave., Chicago, Ill. 60622

Filed Jan. 5, 1981, Ser. No. 222,302
Int. Cl.³ A47F 5/01
U.S. Cl. 211—106 14 Claims

1. A display unit used with an apertured support for displaying a plurality of elongated objects, comprising a plurality of open-ended vertically spaced-apart sleeves each connected to the apertured support by two brackets, each of said brackets being a one-piece member having two engagement prongs for insertion into the apertured support to maintain said brackets thereon, each of said brackets when mounted on the support having a bracing portion thereof extending parallel to and proximate the apertured support and having a closed end portion parallel to said bracing portion and spaced therefrom and from the support, and a leg portion interconnecting said bracing portion and said closed end portion, each of said tubular sleeves being constructed and arranged to receive within said open ends thereof the closed end portion of facing brackets to be supported thereby and to position said sleeves for retaining and displaying a plurality of elongated objects.

10. A bracket for use with an apertured support, comprising a one-piece wire having two free ends thereof formed into

vertically spaced-apart engagement prongs for extending through apertures in the apertured support, the end of said bracket away from said prongs being a closed end constructed to support a sleeve thereon and lying in a plane parallel to the apertured support when said bracket is mounted thereon, the



closed end being connected to said engagement prongs by two legs respectively extending therebetween, each of said legs having a bracing portion thereof parallel to said closed end and proximate the apertured support when said bracket is mounted for use.

4,344,541

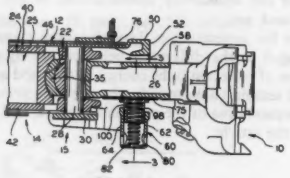
COUPLER CARRIER ARRANGEMENT FOR RAILROAD CARS

Osvaldo F. Chierici, Elmhurst, Ill., assignor to Holland Company, Aurora, Ill.

Continuation of Ser. No. 20,438, Mar. 14, 1979, abandoned, which is a continuation of Ser. No. 828,237, Aug. 26, 1977, abandoned. This application Aug. 4, 1980, Ser. No. 175,318

Int. Cl.³ B61G *7/10*

U.S. Cl. 213—61 **5 Claims**



1. In a railroad car wheeled for riding on track rails and having a car underframe including a center sill projecting from the car end and equipped with a coupler striker casting, a draft gear rigging including a draft gear applied within a draft gear pocket between stops spaced longitudinally of the car and within the center sill, and a yoke embracing the draft gear, said strikerr casting including a striker portion having a striking face disposed in a vertical plane and transversely of the car center line of draft and a window opening disposed transversely of and aligned with the car center line of draft, and a coupler having a coupler head disposed outside of the striker casting window and a shank extending through the striker casting window inwardly of the striker casting and operably connected to the yoke for transmitting buff and draft forces to the car, and having swinging movement sidewise of the car and limited movement longitudinally of the car under gravity as the car ascends and descends sloping track grades, and with a striker casting striker portion defining below said window thereof an upwardly opening socket forming the striker casting cage and defining spaced apart inner and outer upright walls extending generally parallel to said vertical plane, and a coupler carrier resiliently supported in said cage for limited vertical movement, on which the coupler shank rests, with said cage walls each defining a coupler carrier movement limiting wear surface for limiting movement of the coupler carrier longitudinally of the car when the coupler moves longitudinally of the car under gravity as the car ascends and descends sloping track grades,

the improvement wherein:

said coupler carrier comprises a body formed from polyethylene of dry self lubricating characteristics having a molecular weight in the range of from approximately 3,000,000 to approximately 9,000,000,

said body being shaped to define an upper platform portion defining a planar upwardly facing load support surface formed by said polyethylene across the top of same on which the coupler shank rests and which spans the width of the striker casting window,

said body further defining below said load support surface a forward side wall forming an outwardly facing slide surface formed by said polyethylene and opposing the cage outer upright wall movement limiting wear surface, and a rear side wall forming an inwardly facing slide surface formed by said polyethylene and opposing the cage inner upright wall movement limiting wear surface,

said body outwardly facing slide surface bearing against the cage outer upright wall movement limiting wear surface when gravity induces said coupler longitudinal movement outwardly of the striker casting window, and said body inwardly facing slide surface bearing against the cage inner upright wall movement limiting wear surface when gravity induces said coupler longitudinal movement inwardly of the striker casting window,

said body being characterized by having said slide surfaces thereof effecting during transit of the car resurfacing of the cage respective movement limiting wear surfaces they engage under gravity and under vertical vibrations of said body induced by vibration of the coupler shank as the car is moved along a track having a sloping grade, to have a wear free finish over the portions of same that are respectively engaged by the respective body slide surfaces, with said slide surfaces and said finishes tending to harden in use, whereby said cage movement limiting surfaces become effectively resistant to wear under said vertical vibrations of said body.

4,344,542

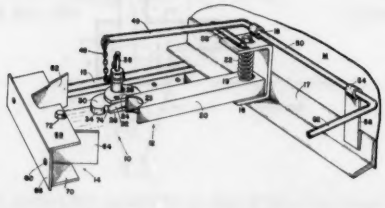
RAILWAY GANG CAR COUPLER

Pete L. Knight, 2036 Mustang La., Arcata, Calif. 95521

Filed Jul. 14, 1980, Ser. No. 168,510

Int. Cl.³ B61G *1/14, 5/00, 7/00*

U.S. Cl. 213—188 **3 Claims**



1. A coupling assembly for a pair of railway cars comprising:

a pair of base members adapted to be mounted on a trailing end of a pulling car and a forward end of a pulled car, respectively;

a tongue having an end is carried on one of said base members;

a receptacle is carried on the other of said base members;

said receptacle having an inwardly angled side wall and a transverse back wall;

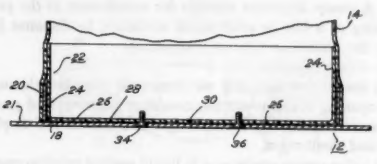
an upright coupling pin extending across said receptacle from top to bottom;

a cam member pivoted on the end of said tongue;
a hook-like recess on one side of said cam member of a size to nest around said lock pin;
a cam surface across a leading end and other side of said cam member adapted to engage said side and back walls to pivot said cam member around behind said coupling pin into engagement therewith;
a spring-biased lock pin carried on said tongue to ride on the top surface of said cam member adjacent the trailing edge thereof until one edge passes therebeneath;
a shaft rotatable on said one base member;
a release arm on one end of said shaft;
an operating lever on the other end of said shaft; and
a tension member secured between said release arm and said lock pin so that upward pivotal movement of said lever will lift said lock pin.

4,344,543
REINFORCED PLASTIC TANK

John J. Hoffman, South Bend, Ind., assignor to Jackel, Inc., South Bend, Ind.

Filed Jun. 19, 1980, Ser. No. 161,056
Int. Cl.³ B65D *90/02*
U.S. Cl. 220—1 B **8 Claims**



1. A reinforced plastic tank comprising a base plate composed of substantially rigid material and extending throughout the bottom of the tank, an annular flange attached to the upper surface of said plate and extending upwardly therefrom, a cup shaped member disposed within said flange, said cup shaped member having a bottom covering the portion of said plate within the area enclosed by said flange and a side wall extending past the upper edge of said flange, and a tank wall of fiberglass covering and seating on the exposed outer surfaces of said flange and the side wall of the cup shaped member, and extending from the upper surface of said plate past said cup side wall to the desired height of said tank.

4,344,544
FLUID PIPE GUARD DEVICE

Victor L. Austin, 9648 Cain Dr. NE., Warren, Ohio 44484

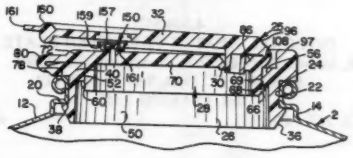
Filed Nov. 24, 1980, Ser. No. 209,745
Int. Cl.³ B67C *3/00*
U.S. Cl. 220—86 AT **6 Claims**

1. An antisiphoning device for the filler tube of a gasoline tank, comprising,
a normally-rectilinear, helically-coiled spring and a flexible tape having a head and a band portion extending from said head, said head having slot for passing said band portion,
said band portion being inserted into said spring at one end thereof and coming out of said spring in the space between convolutions of said spring at a place spaced some distance from said spring one end,
said tape being assembled with said spring in the manner specified and inserted through the opening into said filler tube and inwardly of the latter with said spring one end outermost,
whereby when a pulling force is applied to said band portion to pull the latter through the slot in said head while said spring one end is held against longitudinal movement, said band portion is foreshortened to cause portions of said spring to overlap and crisscross the interior of said filler tube and thereby form an obstruction to restrict the passage of a siphon tube and the like but permitting sufficient openings by reason of the convolutions of said spring to permit gasoline to flow past said obstruction.

4,344,545
PILFERPROOF CLOSURE WITH MECHANICAL INTERLOCK

Anton A. Aschberger, Downers Grove, and John Walter, Evergreen Park, both of Ill., assignors to The Continental Group, Inc., Stamford, Conn.

Filed Apr. 13, 1981, Ser. No. 254,006
Int. Cl.³ B65D *39/00*
U.S. Cl. 220—307 **10 Claims**



1. A closure for a container having a wall member with an aperture, said closure comprising a sleeve member having a seal-tight fit within said aperture and having a bore providing a pour opening, a flexible plastic plug having a seal-tight fit within said opening, a lift lever connected to said plug, a combination pour lip and fulcrum projecting from one of said members for fulcruming engagement by said lever and lifting the plug out of the pour opening, a tearable anti-pilfer means on said lever, and limited-movement-permitting means connecting said anti-pilfer means to said plug, said anti-pilfer means being torn away from said lever upon lifting of said lift lever beyond the permitted limited movement.

4,344,546
REUSABLE TIGHT HEAD DRUM BY CONVERSION TO OPEN HEAD DRUM

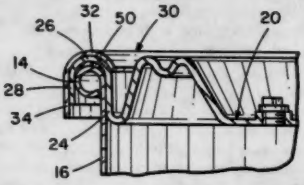
Sidney Dry, Chicago, Ill., assignor to Natico, Inc., Chicago, Ill.

Filed Mar. 31, 1981, Ser. No. 249,694
Int. Cl.³ B65D *45/32*
U.S. Cl. 220—320 **16 Claims**

1. A tight head drum embodying features for convertability for reuse as an open head drum comprising
a drum having an outwardly extending curl at its upper end,
a top head dimensioned to span the open upper end of the drum,
an annular looped portion extending curvilinearly outwardly from the edge of the top head having an interior curvature corresponding to the curvature of the curl for enabling the curl to rest within the looped portion,
an annular skirt extending downwardly from the outer edge of the looped portion and spaced in substantially parallel

relation to the outer wall of the drum and for a distance to extend to a level below the curl,

and a banding member having an upper curvilinear portion



shaped to receive the looped portion in nesting relation and a leg portion extending downwardly from the outer edge of the curvilinear portion dimensioned to have a length greater than the length of the skirt of the top head.

4,344,547

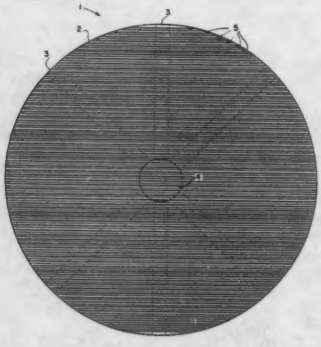
INTEGRAL HEATER FOLLOWER PLATE

Leo M. Moore, Box 103, Rte., 4, Ashland, Va. 23005

Filed Feb. 27, 1980, Ser. No. 125,119

Int. Cl.³ B67D *5/62*

U.S. Cl. 222—146 HE **6 Claims**



1. An integrally fabricated heater follower plate for use with hot melt dispensing apparatus, comprising:

a biscuit of heat conducting material shaped to fit inside a container of hot melt material;

a plurality of fins machined out of the bottom surface of said biscuit of heat conducting material;

a single vertical hole cut from the top surface of said biscuit of heat conducting material down toward said bottom surface into communication with the spaces between said plurality of fins;

heating means in intimate heat contact relationship with said biscuit of heat conducting material; and,

a plurality of spaced apart horizontal holes cut from the edge surface of said biscuit through said fins into communication with said single vertical hole.

4,344,548

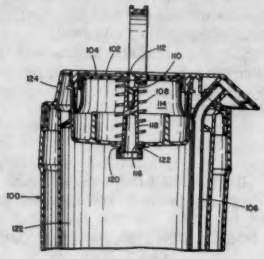
PUMP DISPENSERS FOR CONTAINERS

Albert A. Frazier, Nashville, Tenn., assignor to Aladdin Industries, Incorporated, Chicago, Ill.

Continuation of Ser. No. 973,752, Dec. 28, 1978, abandoned, which is a continuation-in-part of Ser. No. 901,297, May 1, 1978, abandoned. This application Sep. 26, 1980, Ser. No. 191,325

Int. Cl.³ F04B *43/02*; B65D *47/34*; B67D *5/42, 5/54*

U.S. Cl. 222—209 **4 Claims**



1. A pump dispenser suitable for attachment to the pouring opening of a hot or cold liquid container to dispense liquids from the container interior comprising:

(a) an air chamber,

(b) means for pumping air from said chamber through an opening therein into the container interior, said pumping means including a diaphragm and means for displacing said diaphragm,

(c) valve means positioned in liquid sealing relation over said opening and operatively connected to said displacing means for displacement away from said opening only during pumping of air from said chamber into said container whereby said chamber is normally sealed against the entry of liquid from said container through said opening wherein said valve means includes:

a valve stem disposed within said air chamber, one end thereof connected to said displacing means,

a removable valve assembly which is adapted to be selectively extended through said opening into said air chamber to permit said assembly to be secured to the other end of said valve stem, said assembly when secured, except during pumping, being positioned in sealing relation over said opening, but when said assembly is not secured to said valve stem a venting path through said air chamber is provided to permit the storing of hot liquids.

4,344,549

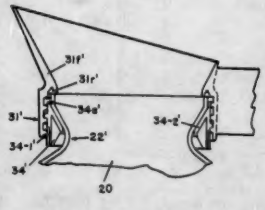
CLOSE FITTINGS FOR FRANGIBLE OBJECTS

Joseph R. Paradis, Holden, and Edward W. Kaleskas, Jefferson, both of Mass., assignors to Nypro Inc., Clinton, Mass.

Filed May 27, 1980, Ser. No. 153,756

Int. Cl.³ A47G *19/14*

U.S. Cl. 222—465 A **18 Claims**



1. A fitting for a frangible object having an inclined neck

having an outer rim extending directly from said object, comprising:

a collar for the neck of said object, said collar having interior screw threads;

a split-ring member engageable with said collar and threadable thereinto, said split ring member having a tapered inner wall which is complementary to said inclined neck;

and a gasket between said collar and said rim of said neck of said object which is drawn tightly against said neck by the threading of said member into said collar;

thereby to provide a close fitting for said frangible object with reduced danger of breakage.

4,344,550

SELF-ADJUSTING ARRANGEMENT FOR REFRACTORY PLATES OF SLIDE GATE MECHANISM

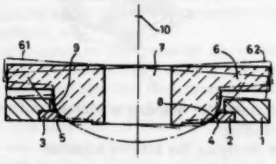
Stanislav Szadkowski, Brussels, Belgium, assignor to Vesuvius International Corporation, Wilmington, Del.

Filed Jul. 7, 1980, Ser. No. 166,203

Claims priority, application United Kingdom, Jul. 17, 1979, 7924902

Int. Cl.³ B22D *41/08*

U.S. Cl. 222—600 **10 Claims**



1. An arrangement for supporting a refractory plate in a supporting frame of a slide gate of a pouring vessel, comprising: a seat defined on said supporting frame having at least two sliding bearing surfaces, and two corresponding sliding bearing surfaces defined on said refractory plate to form two pairs of sliding surfaces between the supporting frame and the refractory plate, at least one sliding surface of each pair having a curved shape to allow the refractory plate to freely oscillate with respect to the supporting frame.

4,344,551

TRANSPORTABLE APPARATUS FOR CUTTING AND DISPENSING ROLL MATERIAL

Michael J. Albin, Miami, Fla., assignor to Equipment Company of America, Hialeah, Fla.

Filed Jun. 19, 1980, Ser. No. 161,105

Int. Cl.³ B26F *3/02*; B26D *1/02*

U.S. Cl. 225—86 **10 Claims**

1. An apparatus for cutting and dispensing sheet material from a roll of sheet material comprising:

a rectangular base frame;

front and rear upright standards mounted on the front and rear ends of said base frame, respectively, in a longitudinally aligned manner;

a cutting and dispensing table assembly extending longitudinally between the upper ends of said front and rear upright standards;

means associated with each said standard to receive and support opposite ends of a sheet roll axle shaft such that said axle shaft is longitudinally disposed intermediate said base frame and said table assembly;

said table assembly including a table having an upper bearing surface including a longitudinally extending feed edge over which a length of sheet material is drawn from a roll supported on said axle shaft;

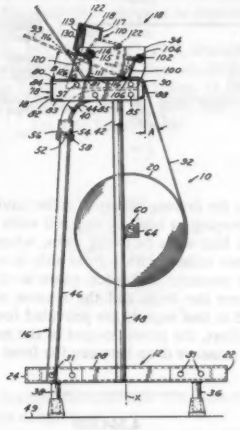
said table having front and rear support means adjacent each end thereof;

said upright standards being mounted asymmetrically on said base frame entirely on one side of a given vertical plane which includes the longitudinal center line of said base frame, and wherein said receiving and support means being operative to dispose said shaft axle on the inboard side of said front and rear standards substantially on the longitudinal center line of said base frame;

pivotal sheet retaining brake means extending longitudinally between said front and rear support means adjacent said one feed edge operative for rotational gravity biased movement in a first retaining direction toward said one feed edge into an engaged position with said bearing surface with the sheet material from a roll supported on said axle shaft retained therebetween, and said brake means operative for rotational movement in a second sheet material dispensing direction away from said bearing surface one feed edge;

said retaining brake means being in the form of a retaining plate extending longitudinally between said front and rear support means and mounted thereto by pivotal means aligned along its one longitudinal side, said retaining plate including a retaining edge at it other longitudinal side which is operative for rotational movement in said first direction into engagement with said bearing surface;

pivotal sheet cutting blade means extending longitudinally between said front and rear support means operative for



resiliently biased, snap-action, rotational movement in either said first or second direction to first cutting and second dispensing overcenter positions;

said blade means first overcenter cutting position resulting in engagement by said blade means with said bearing surface intermediate the bearing surface other longitudinally extending edge and said brake means;

said blade means second overcenter dispensing position locating said blade means a predetermined distance above said bearing surface;

the arrangement characterized in that with said blade means in said second overcenter dispensing position the sheet material, upon being lifted upwardly from said bearing surface operative for releasing said brake means by rotating same in said second dispensing direction allowing a desired length of sheet material to be drawn over said one feed edge onto said bearing surface, with the sheet material being retained thereon by said brake means returning to its engaged position, whereby with said blade means returned to said cutting position, and the desired length of sheet material cut thereby from the roll the cut end is retained by said brake means in a readily accessible manner for the next desired length to be dispensed and cut;

said cutting blade means being in the form of plate means

extending longitudinally between said end support means and mounted thereto by pivotal means aligned along an intermediate portion of said plate means, said plate means having a cutting blade portion including a cutting edge at its one longitudinal side for rotational movement in said first or second directions;

said plate means having an overcenter plate portion positioned radially outwardly from its pivotal means in substantially 180° opposed relation to said cutting blade portion, and spring means interconnected between said table and said overcenter plate portion providing said snap-action rotational movement to said first cutting and second dispensing overcenter positions.

4,344,552

INDEPENDENT DRIVE FOR A ROLLER CAVITY SUCTION APPARATUS

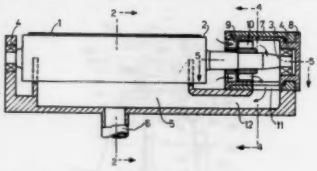
Hans Gref, Cologne, Fed. Rep. of Germany, assignor to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Apr. 16, 1980, Ser. No. 141,136

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1979, 2915804

Int. Cl.³ B65H *17/28, 23/22*

U.S. Cl. 226—95 **3 Claims**



1. A device for driving rollers of roller cavity suction apparatus for conveying or braking material webs of, for example, photographic film webs or paper webs, wherein the web lies on at least two rollers with a front side in contact with the rollers and a pressure difference exists in the region of the rollers between the front and the reverse side of the web, characterized in that motors are provided for driving at least one of the rollers, the power output of the motors is brought about by the pressure drop between the front and reverse side of the web.

4,344,553

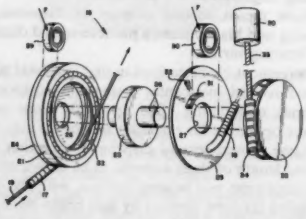
WELDING WIRE FEED DEVICE

Howard D. Lesher, Woodland Hills, and James T. Taff, Simi Valley, both of Calif., assignors to Dimetrics, Inc., Diamond Springs, Calif.

Filed Feb. 17, 1981, Ser. No. 234,614

Int. Cl.³ B65H *51/02*

U.S. Cl. 226—168 **7 Claims**



1. A welding wire feed device including, in combination:

(a) a ball bearing having an inside rotatable race; and

(b) side plates defining an entrance guide and an exit guide respectively tangential to said race at opposite side points spaced circumferentially as measured about the inside of the race

whereby a welding wire passing through said entrance guide and about the inside of the race and out said exit guide will have a bend formed therein as the wire is urged through the inside race, the inside race turning with movement of the wire so that friction is minimized.

4,344,554

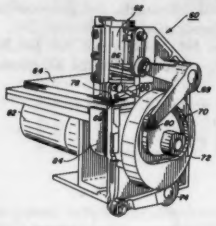
STAPLING APPARATUS

Thomas R. Cross, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 2, 1978, Ser. No. 948,060

Int. Cl.³ B27F *7/17*

U.S. Cl. 227—30 **5 Claims**



1. An apparatus for stapling a plurality of articles to one another, including:

means for clamping the articles together;

means for driving a staple through the clamped articles;

means for clinching the portion of the staple legs protruding through the articles;

a common member; and

means for coupling said common member to said clamping means, said driving means and said clinching means to enable said common member to activate sequentially said clamping means, said driving means, and said clinching means.

4,344,555

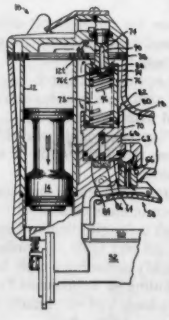
SELF-CYCLING PNEUMATIC FASTENER APPLYING TOOL

Robert Wolfberg, Skokie, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Feb. 19, 1980, Ser. No. 122,526

Int. Cl.³ B25C *5/13*

U.S. Cl. 227—130 **7 Claims**



1. In a fastener applying device having a housing joined to a supply of fluid under pressure and including a working cylin-

der having a fastener driver means reciprocable therein in a cycle including one working and one return stroke, a first means for biasing said fastener driver means to the end of said return stroke, a means for feeding a fastener into position to be driven after each return stroke of said fastener driver means, a main valve means for controlling the flow of said fluid under pressure into said working cylinder above said fastener driver means and, an exhaust valve means for venting to atmosphere that portion of said working cylinder above said fastener driver means, an improved control structure comprising:

(a) a control cylinder having one end closed and one end opened to said supply of fluid pressure in said housing;

(b) a control piston movable within said control cylinder from a first position to a second position effective to open said main valve means and to close said exhaust means, said control piston being integral to said main valve means, said control piston and the closed end of said control cylinder defining a control chamber, the first side of said control piston being defined as that side of said control piston continuously exposed to the air pressure in said housing, said housing pressure thus biasing said control piston to said second position;

(c) a first flow means in said control piston for effecting flow communication between said control chamber and said supply of fluid under pressure;

(d) a second flow means in said control piston for effecting flow communication between said control chamber and the atmosphere;

(e) means responsive to the pressure above said fastener driver means for sequentially closing said second flow means and opening said first flow means, and closing said first flow means and opening said second flow means to the effect that said control piston is cycled between said first and said second positions with said fastener driver means being cycled through said working and return strokes in response thereto.

4,344,556

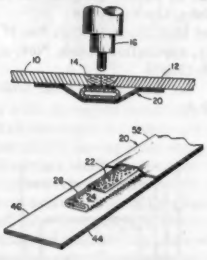
WELDING BACKUP TAPE AND ITS METHOD OF MANUFACTURE

Donald K. Knapp, 16802 SE. 28th St., Bellevue, Wash. 98008

Continuation of Ser. No. 43,311, May 29, 1979, abandoned. This application Jul. 6, 1981, Ser. No. 280,834

Int. Cl.³ B23K *5/22, 9/02;* **C09J** *7/02*

U.S. Cl. 228—50 **8 Claims**



1. A welding backup tape, comprising:

(a) a heat treated, braided, substantially finely woven fiberglass material of sleeve like cross section having a high temperature fired on refractory coating on its upper portion, freed of all matter which would otherwise later cause outgasing, which is derived from mixing solutions of two parts of colloidal silica solution and one part of a titanium dioxide refractory coating;

(b) a silicone adhesive coated fiberglass carrier tape positioned below and centered against the lower portion of the refractory coated fiberglass material; and

(c) a thin polyethylene film release material ranging in thickness from 3 to 6 mils pressed down over the coated fiberglass material and into adhesive contact with the said fiberglass carrier tape.

3. A method of manufacturing a welding backup tape, comprising:

(a) mixing into solution a colloidal silica solution with a titanium dioxide refractory coating solution;

(b) applying this resulting solution as a coating to the upper portion of a heat treated, braided, finely woven fiberglass material;

(c) heating this coated fiberglass material at a sufficiently high temperature to activate its binding capability, to burn off all its organic matter from both the fiberglass material and coating, and to remove all water;

(d) bringing together from respective supply sources, this coated fiberglass material, a silicone adhesive coated fiberglass carrier tape, and a release material;

(e) pressing the fiberglass material, coated side up, down upon the center of the carrier tape, adhesive side up; and

(f) pressing the release material down on both the coated fiberglass material and the carrier tape, to affix itself to the exposed adhesive of the carrier tape at either side of the affixed fiberglass material.

4,344,557

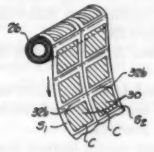
DETACHABLY CONNECTED CONTAINER STRIPS

Bernard Lerner, Hudson, Ohio, assignor to Automated Packaging Systems, Inc., Twinsburg, Ohio

Division of Ser. No. 897,752, Apr. 17, 1978, abandoned, which is a continuation of Ser. No. 749,234, Dec. 10, 1976, abandoned, which is a division of Ser. No. 612,462, Sep. 11, 1975, Pat. No. 4,041,845. This application Jun. 18, 1980, Ser. No. 160,656

Int. Cl.³ B65D *30/00*

U.S. Cl. 229—53 **11 Claims**



1. A strip of flexible thermoplastic film material for use in packaging articles comprising:

(a) a first elongated strip portion defined by first and second confronting film plies having attached longitudinally extending side edges;

(b) said plies defining a series of longitudinally spaced apart transversely extending lines of ply weakness rendering said plies separable to provide longitudinally spaced separable contents receiving zones between said lines, one of said plies defining a contents receiving opening in each said zone, said contents receiving opening extending transversely of said strip portion;

(c) a second elongated strip portion defined by first and second confronting film plies having attached longitudinally extending side edges;

(d) said film plies of said second strip portion defining a series of longitudinally spaced apart transversely extending lines of ply weakness rendering said plies of said second strip portion separable to provide longitudinally spaced apart contents receiving zones between said lines, a film ply of said second strip portion defining a contents receiving opening in each of said zones extending transversely of said second strip portion;

(e) said first and second strip portions coextending with each other, with each of said lines of weakness, contents receiving opening and contents receiving zones of one strip portion registered with a respective line of weakness,

contents receiving opening and contents receiving zone of the other strip;

(f) a longitudinal edge portion of one strip portion adjoining a longitudinal edge portion of said other strip portion;

(g) said adjoining edge portions defined by longitudinally extending heat seal beads between the respective first and second plies of said strip portions; and,

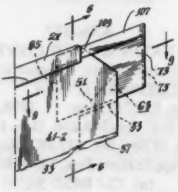
(h) bridge structure detachably connecting said beads together along said strip portions, said bridge structure defined by material integral with said beads and having a thickness substantially less than the thickness of said beads whereby said adjoining strip edge portions are readily separable by breaking said bridge structure.

4,344,558

PINCH BOTTOM VALVE BAG

Donald O. Newton, Pensacola, and Fred B. Wilharm, Cantonment, both of Fla., assignors to St. Regis Paper Company, New York, N.Y.

Filed Jul. 7, 1980, Ser. No. 166,171
Int. Cl.³ B65D *30/24*
U.S. Cl. 229—62.5 **4 Claims**



1. A gusseted stepped end pinch bottom valve bag having a multi-ply tubular body, said bag comprising:

an inner ply of flexible sheet material and an outer ply of flexible sheet material;

a front wall formed from said plies and having a terminal edge;

a rear wall formed from said plies and having a terminal edge at which said inner and outer plies are in stepped relation to one another;

a pair of first gusset panels formed from said plies and foldably connected to said front wall along a first pair of longitudinal fold lines;

a pair of second gusset panels formed from said plies and foldably connected to said first panels along a second pair of longitudinal fold lines and to said rear wall along a third pair of longitudinal fold lines;

a valve opening formed from an infolded portion of said bag at a corner thereof adjacent said terminal edges, said infolded portion including portions of the inner and outer plies of said front and rear walls;

a valve sleeve sandwiched within said infolded portion, said valve sleeve comprising front and rear rectangular panels, said rear panel being adjacent an infolded portion of the outer ply of said rear wall and said front panel being adjacent an infolded portion of the outer ply of said front wall, said rear panel having a lip portion extending beyond an edge of said front panel and the adjacent terminal edge of said front wall, said lip portion being folded over said front panel and front wall edges and secured to said front panel and front wall by adhesive means;

said stepped terminal edge of said rear wall extending beyond the terminal edge of said front wall and being, folded-over said lip portion and said front wall and secured to said front wall by adhesive means; and

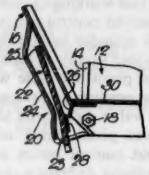
a slit in the outer ply of said rear wall, said slit separating the infolded portion of said rear wall outer ply, which is part of said valve opening, from the portion of said rear wall outer ply which is part of the folded-over rear wall terminal edge.

4,344,559

SIGNAL DEVICES FOR RURAL MAILBOXES

Ernest G. Widham, 145 Great Neck Rd., Waterford, Conn. 06385

Filed Oct. 6, 1980, Ser. No. 194,138
Int. Cl.³ B65B *91/00*
U.S. Cl. 232—35 **4 Claims**



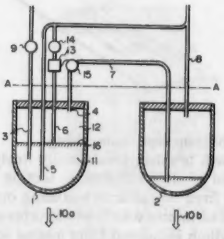
1. In a mailbox, the combination with a box having a bottom and front end; a gate hinged at its bottom to the bottom of the box and provided with a longitudinal casing having a bottom with an aperture and opposite shoulders; a longitudinal signal flag having opposite side ears at the top and being received in said casing with lateral play and for longitudinal movement into raised and lowered positions, with said flag in its raised position being retracted in said casing, and in said lowered position being with its ears suspended from said shoulders and gravitating through said aperture; a pair of ferromagnetic strips of which at least a certain strip is a permenant magnet, with said strips being carried by said flag and by the bottom of said box at said front end, respectively, and so coordinated that the strip on the box extends in an upright plane and is in substantial planar magnetic engagement with the other strip on said flag in said raised position, and said strip on the box is further spaced forwardly and upwardly from the hinge axis of the gate so that on opening the latter the strip on the flag will turn on the other strip as a fulcrum and thus gradually weaken and finally break the magnetic bond between them for release of the flag for its gravitational drop to its lowered position.

4,344,560

CONTAINER, APPARATUS AND METHOD FOR SEPARATING PLATELETS

Norio Iriguchi, Fuji; Hiroshi Unno, Shizuoka, and Nobuaki Tsuda, Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 20, 1980, Ser. No. 198,741
Claims priority, application Japan, Nov. 2, 1979, 54-141190; Sep. 10, 1980, 55-124674
Int. Cl.³ B04B *11/02, 3/00*
U.S. Cl. 233—19 A **10 Claims**



1. A container for continuously separating platelets component in blood, comprising: a first closed chamber and a second closed chamber adaptable to be rotated around a rotation axis, means for continuously introducing whole blood into said first chamber, means defining a first outlet port opened to said first

chamber at a relatively short distance from said rotation axis for discharging platelet-rich plasma being obtained as supernatant in said first chamber, means defining a second outlet port opened to said first chamber at a relatively long distance from said rotation axis for discharging precipitation in said first chamber, means for monitoring the consistency of the blood in said first chamber, said monitoring means containing a sensor means, with one end of the monitoring means being at a predetermined position which differs from the opened position of said first outlet port and which predetermined position is located between a position "60" and a position "95", assuming an equal divisional scale of 100 provided between the opened position of said first outlet port means, which is the position "100", and the opened position of said second outlet port means, which is the position "0", with respect to the distance from said rotation axis, means for connecting said first outlet port means with said second chamber, and means defining a third outlet port opened to said second chamber for discharging supernatant in said second chamber, whereby platelets component in blood are obtained as precipitation in said second chamber upon rotation of the second chamber around the rotation axis.

4,344,561

CENTRIFUGAL TYPE OIL FILTER FOR AN ENGINE

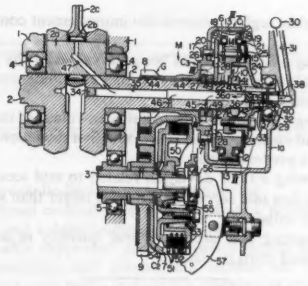
Yoshitoku Iizuka, Urawa, and Kiyokazu Ohkubo, Wako, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 12, 1980, Ser. No. 177,376

Claims priority, application Japan, Aug. 15, 1979, 54-112219[U]; Aug. 17, 1979, 54-113215[U]; Aug. 21, 1979, 54-115113[U]; Aug. 24, 1979, 54-116604[U]

Int. Cl.³ B04B *9/08*

U.S. Cl. 233—24 **16 Claims**



1. In combination with an engine transmission system comprising a crank shaft of the engine having an oil passage axially formed therein; a first clutch having a driving plate concentrically mounted on the crank shaft for rotation therewith; and transmission means operatively associated with said first clutch to transfer power from said crank shaft to wheels of a vehicle; a centrifugal type oil filter comprising a filter cap concentrically secured to one side of said driving plate interiorly defining therewith an annular centrifugal separating chamber in communication with said oil passage.

4,344,562

CENTRIFUGE CELL COLLECTOR APPARATUS

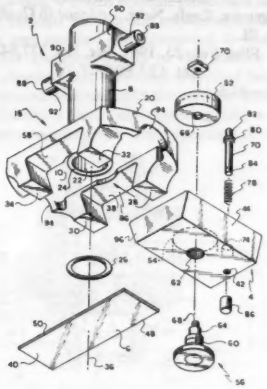
Andrew Ricci, 1450 E. 95th St., Brooklyn, N.Y. 11236

Continuation-in-part of Ser. No. 8,384, Feb. 1, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 181,230

Int. Cl.³ B04B *15/00*

U.S. Cl. 233—26 **8 Claims**

1. An apparatus for the preparation of samples for microscopic examination by deposition of centrifuged cells upon a conventional glass slide, comprising: a hollow elongated reservoir with an open bottom and an open top; a lower body attached to the bottom of the reservoir and having a recess for accommodating a conventional glass slide transversely to the reservoir to cause the slide to abut the open bottom thereof, said body having first, second, third and fourth projections integral with the lower body and extended downwardly therefrom and arranged to form a channel between said projections; an elongated holder adapted to slide into and out of said channel and cooperating with the lower body so that said holder is detachably received therein to lock a slide in said body and to



allow a slide to be removed from said lower body; and studs attached to the housing near its top for detachably securing the reservoir to a centrifuge, the projections being so located that the first and third projections will be adjacent a first side of the holder and the second and fourth projections will be adjacent a second side of the holder when the holder is received in the channel, and further being so located that the first and second projections will be adjacent a first side of the slide and the third and fourth projections will be adjacent a second side of the slide when the slide is accommodated in the recess.

4,344,563

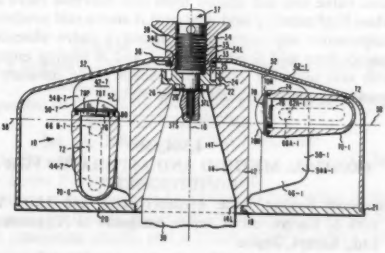
CENTRIFUGE ROTOR HAVING VERTICALLY OFFSET TRUNNION PINS

William A. Romanauskas, Saulsbury, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 23, 1980, Ser. No. 220,199

Int. Cl.³ B04B *9/12*

U.S. Cl. 233—26 **10 Claims**



1. In a centrifuge rotor of the type having a hub from which a plurality of arms radiate outwardly, each arm having a first and a second vertically-extending surface on opposite sides thereof and a trunnion-receiving bore extending into the arm from each surface, characterized in that the axis of the bore

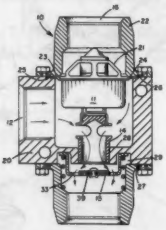
extending into the arm from the first surface lies above a horizontal plane extending through the arm while the axis of the bore extending into the arm from the second surface lies below the horizontal plane and that the bores on confronting surfaces of angularly adjacent arms each lie on the same side of the horizontal plane.

4,344,564

THERMAL BY-PASS VALVE WITH INTEGRAL PRESSURE RELIEF

Ruel D. Magnuson, Eagle, Nebr., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Feb. 23, 1981, Ser. No. 237,543
Int. Cl.³ F01P 7/16
U.S. Cl. 236—34.5 **8 Claims**



5. A thermal by-pass valve with integral pressure relief comprising a body with an annular guiding shoulder having a generally linear flow passage therein with first and second outlet ports adjacent each end of said passage, a movably mounted valve seat in said passage adjacent said first outlet port and a fixed valve seat in said passage adjacent said second outlet port, an inlet port in said body communicating with said passage between said valve seats, said body including a block-like part providing a T-shaped passage, the bar of said T terminating adjacent said outlet ports and the stem of said T terminating adjacent said inlet port, and a pair of generally similar fittings secured to said body each defining an outlet port, a temperature sensitive valve element slidably mounted in said passage, said temperature sensitive valve element being equipped with a hollow sleeve extending toward said movable seat and being in guided relationship with said shoulder, said sleeve presenting a relatively small annular force area as compared to said temperature sensitive valve element to facilitate shift of said temperature sensitive valve element even under pressure, said sleeve being equipped with fluid inlet means adjacent the end spaced from said movable seat, said temperature sensitive valve element when fluid entering said inlet port is below a predetermined temperature being seated against said fixed valve seat and spaced from said movable valve seat and when fluid entering said inlet port is above said predetermined temperature said temperature sensitive valve element being spaced from said fixed valve seat and in seating engagement with said movable valve seat except when pressure in said passage exceeds a predetermined value.

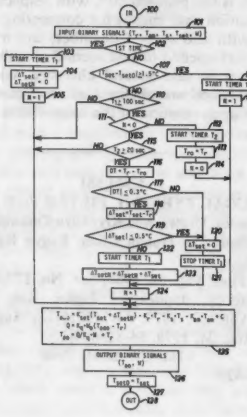
4,344,565

CONTROL METHOD AND APPARATUS FOR AIR CONDITIONERS

Yasuhumi Kojima, Gifu; Atsunori Saito, and Akiro Yoshimi, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 23, 1980, Ser. No. 171,407
Claims priority, application Japan, Aug. 1, 1979, 54-98529
Int. Cl.³ G05D 23/00
U.S. Cl. 236—46 R **7 Claims**

1. A method of controlling an air conditioner which supplies an air flow into a compartment or other region, the air conditioner comprising air flow quantity control means and air flow temperature control means, the method comprising the steps of detecting the quantity of heat necessary for adjusting the actual temperature of air in said compartment or other region to a desired value and to maintain it at said desired value, and controlling said air flow temperature control means in such manner that the air flow temperature is such as to enable the air flow at a desired air flow quantity to supply said necessary heat quantity, said necessary heat quantity and said air flow temperature being determined employing electric signals in the form of a first electric signal indicative of the actual air temperature in said compartment or other region and a second electric signal indicative of a desired air temperature in said compartment or other region, wherein the improvement comprises the steps of:



detecting a first deviation between values of the preceding and following first electric signals at a predetermined time interval;

detecting a second deviation between values of the first and second electric signals when said first deviation is smaller than a predetermined value;

determining a third deviation related to said second deviation when said second deviation is larger than a predetermined value; and

compensating said necessary heat quantity in accordance with said third deviation.

4,344,566

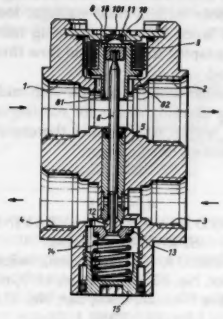
THERMOSTATIC EXPANSION VALVE

Rudibert Götzenberger, Remseck, Fed. Rep. of Germany, assignor to Ernst Flitsch GmbH & Co., Fellbach, Fed. Rep. of Germany

Filed May 29, 1980, Ser. No. 154,491
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1979, 2922872
Int. Cl.³ F25B 41/04
U.S. Cl. 236—92 B **2 Claims**

1. A thermostatic expansion valve assembly for a refrigerant cycle including a compressor, a condensor and an evaporator and operating in response to suction gas of said cycle comprising: a valve housing defining a suction line for passage of said suction gas through said valve assembly; valve means including a valve tappet acted upon by said suction gas for actuation of said valve means; a control member responsive to pressure and temperature receiving the upper end of said valve tappet through which said suction gas acts on said valve tappet; said control member being formed in a cup-shaped configuration opening toward said suction line and including a rim region projecting into said suction line and a circumferential region

having a greater wall thickness than said rim region; an annular shoulder formed on said control member; a cover plate for said valve housing; and a corrugated tube surrounding said circumferential region of said control member; said corrugated tube



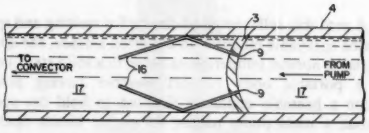
having one end connected to said annular shoulder and another end connected to said cover plate; with a spring being arranged on the outer surface of the bottom of said control member, said spring operating to press a sealing disc against a bore of said cover plate.

4,344,567

HYDRAULIC HEATING SYSTEM

C. James Horne, Box 184, Rte. 113, Lederach, Pa. 19450, and Edward A. Duffy, P.O. Box 100, Kulpsville, Pa. 19443

Filed Dec. 31, 1980, Ser. No. 221,593
Int. Cl.³ F28C *3/00*
U.S. Cl. 237—1 R **9 Claims**



1. A hydraulic heating system comprising:

A. a closed conduit defining an hydraulic pressurizing section and a depressurized return section;

B. a baffle supported perpendicularly within said conduit intermediate said pressurizing section and said return section, said baffle including a plurality of orifices in the size range 0.094–0.098" and said orifices being disposed with respect to the longitudinal axis of said conduit at an angle in the range 30°–71°;

C. an oil pressurizing pump supported in said conduit on the anterior side of said baffle, so as to flow oil through said orifices at a pressure in the range 70–220 p.s.i.;

D. a liquid oil medium supported within said conduit and flowed through said baffle by means of said pump, said oil being heated both by the frictional impact of restricted flow through said orifices and the shear of flowing oil against non-flowing oil on the posterior side of said baffle.

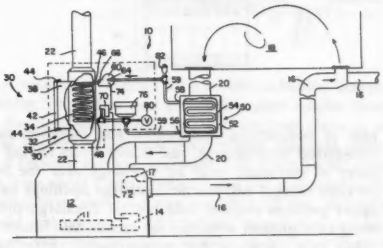
4,344,568

CLOSED-LOOP HEAT-RECLAIMING SYSTEM

Owen E. Stewart, R.R. #1, Cambridge City, Ind. 47327, and Carl W. Stewart, P.O. Box 317, Dublin, Ind. 47335

Filed Mar. 10, 1980, Ser. No. 128,661
Int. Cl.³ F24D *3/00*
U.S. Cl. 237—8 R **9 Claims**

1. In a forced-air heating system which includes means for burning fuel to heat air, means for circulating air in proximity to the fuel-burning means to transfer heat therefrom to the air and for circulating the heated air through a heated air duct, a cold-air return duct, a chimney flue for venting gases produced by the burning fuel, and a control system for energizing the fuel-burning means in response to a demand for heat, and for de-energizing the fuel-burning means when the demand is met, the improvement comprising a closed-loop heat-transfer apparatus for reclaiming heat from gases in the chimney flue of the heating system, the heat-transfer apparatus including a first heat-exchanger chamber positioned in series with the chimney flue, the first chamber including a fluid inlet opening and a fluid outlet opening, a coiled conduit positioned interior to the chamber, the conduit having one end connected to the fluid inlet opening and another end connected to the fluid outlet opening, means allowing access to the interior of the first chamber for cleaning and servicing, a second heat-exchanger chamber positioned in series with the cold-air duct, the second chamber including a fluid inlet opening and a fluid outlet opening, means coupling the fluid openings of the first and



second chambers to form a closed circulatory loop, a predetermined quantity of heat-transferring fluid contained in the loop, means for circulating the predetermined quantity of fluid through the loop between the first and second chambers to heat the quantity of fluid, transfer the heat therefrom to the cold air in the return duct, and reheat the same quantity of fluid, a temperature-actuated control coupled in the loop in proximity to the fluid outlet opening of the first heat-exchanger chamber to sense maximum temperatures of the fluid, the temperature-actuated control including a high limit control and a low limit control, means electrically connecting the low limit control to the fluid circulating means, the fluid circulating means being activated when the maximum temperature of the fluid exceeds a first predetermined temperature, and means electrically connecting the high limit control to the control system for activating and deactivating the fuel-burning means, heat production by the fuel-burning means being reduced when the maximum temperature of the fluid reaches a second predetermined temperature.

4,344,569

STEAM POWERED STOVE

James J. Gardner, 210 Sherman Ave., Lancaster, Ohio 43130

Filed Jan. 17, 1980, Ser. No. 112,735
The portion of the term of this patent subsequent to Jul. 22, 1997, has been disclaimed.
Int. Cl.³ B60H *1/02;* **F24D** *1/04, 5/00*
U.S. Cl. 237—12.1 **1 Claim**

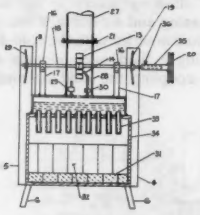
1. A Steam Powered Stove comprising:

A. a stove means having a liquid containing portion therein, a means for feeding said liquid containing portion, a means of exhausting steam, and a steam pressure safety valve means,

B. a steam pressure regulator means having a long stemmed hand wheel thereon whereby steam pressure may be conveniently adjusted and set at various pressures, said regulator means further consisting of a nozzle attached thereto whereby steam pressure may be directed to a turbine,

C. a turbine means having a body with a plurality of blades extending therefrom said body being centered about a shaft such that said turbine blades are equidistant from said shaft's centerline said body being securely mounted on said shaft and generally centered thereon whereby torque may be transmitted to a plurality of fan means positioned on said shaft, said shaft being supported from a plurality of support blocks having bearings mounted thereon said fan means being securely mounted on said shaft and are positioned and designed to blow hot air from heater boxes,

D. a plurality of heater boxes positioned adjacent to the firebox and liquid containing portion of said stove means and in thermal communication therewith whereby the



heat of conduction, convection, and radiation may be transferred therethrough, said heater boxes having a plurality of secreened cold air openings near the bottom portions thereof and hot air discharge openings near the upper portions thereof, said hot air discharge openings being in alignment with said fan means, said heater boxes rising to a vertex at the approximated centerline and above said shaft,

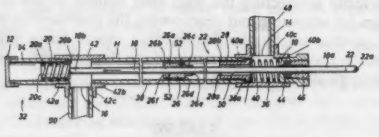
E. and a removable torque transfer means or pulley whereby other equipment may be driven by said stove means, said torque transfer means being securely mounted to said shaft in such a manner that it may be conveniently removed and replaced.

4,344,570

APPARATUS FOR CLEANING THE INTERIOR OF TUBES

Richard R. Paseman, 5517 Newport, Houston, Tex. 77023

Filed Aug. 11, 1980, Ser. No. 176,999
Int. Cl.³ B05B *3/04, 3/18*
U.S. Cl. 239—67 **7 Claims**



1. An improved apparatus for cleaning the interior of pipes, tubes and like elongated tubular objects with pressurized fluid of the type having a housing capable of containing fluid under pressure with a front end, a back end, a fluid inlet adjacent said front end adapted to receive fluid under pressure, and a fluid outlet adjacent said back end in fluid communication with said fluid inlet; a hollow lance, with a forward end and a rearward end, mounted for reciprocal sliding motion through said housing front end responsive to fluid pressure; a piston for causing reciprocal motion of said lance responsive to fluid pressure mounted to said lance adjacent said lance rearward end within said housing; a cleaning nozzle mounted on said lance forward end outside of said housing in fluid communication with said housing through said hollow lance; wherein the improvement comprises:

a forward motion arresting means mounted in said housing to arrest the forward motion of said lance, said forward motion arresting means comprising:

a plug member mounted with said lance adapted to allow fluid flow within said housing between said plug member and an inner surface of said housing

a body member with a fluid passage, loosely mounted about said lance between said plug member and said fluid inlet adapted to allow fluid flow through said fluid passage; and

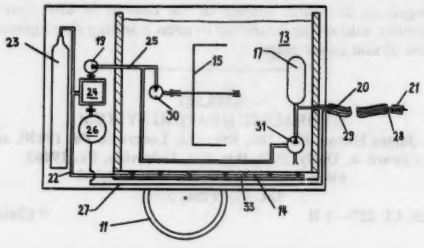
said plug member when in contact with said body member comprising blocking means for substantially preventing fluid flow within said housing thereby dampening the forward motion of said lance.

4,344,571

SELF-CONTAINED DEVICE FOR SPRAYING A HEATED SPRAY MATERIAL

Armin Kündig, Eichstr. 4, 8620 Wetzikon, Switzerland

Continuation of Ser. No. 33,415, Apr. 26, 1979, abandoned. This application Nov. 28, 1980, Ser. No. 211,455
Int. Cl.³ B05B *1/24*
U.S. Cl. 239—130 **6 Claims**



1. A movable self-contained device for melting and spraying a heated sprayable material on a desired surface, the sprayable material at normal temperatures being in a solid state, comprising: a portable body support member having positioned thereon a heatable container adapted to hold the sprayable material; a main pump means; an engine means operatively connected to said main pump means for driving said main pump means, said main pump means being operatively connected to a discharge pump means and a stirring apparatus, both positioned in said container for agitating the heated sprayable material when heated and discharging the heated material from said container; a flexible electrically heatable conduit having a spraying nozzle at the free end thereof and being connected at its other end to said discharge pump means, said discharge pump means being adapted to force said heated material through said conduit and nozzle when said material is in a heated condition; a fluid fuel supply means for supplying a fluid medium both for heating said container to change said solid material to a sprayable state and for driving said engine means; and an electric generator means operatively connected to and drivable by said engine means, said generator means being electrically connected to said heatable conduit to electrically energize said heatable conduit and heat it during the operation of said device.

4,344,572

POSITIONING APPARATUS FOR BOOM STRUCTURES

Loren E. Tyler, 1165 Oakwood Ave., Benson, Minn. 56215

Filed Jun. 18, 1980, Ser. No. 160,677
Int. Cl.³ A01C *3/04*
U.S. Cl. 239—168 **18 Claims**

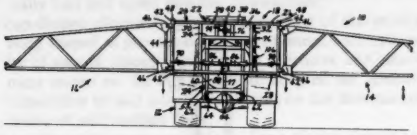
1. A positioning apparatus comprising:

a boom structure;

frame means for supporting said boom structure;

means for attaching said frame means to a vehicle;

means for mounting said boom structure on said frame means for movement about a pivotal axis, said boom structure being mounted with the center of gravity of said boom structure beneath the pivotal axis of said mounting means when the vehicle is on level ground whereby said



boom structure automatically seeks an orientation perpendicular to the gravitational force regardless of the orientation of said frame means; and

means for yieldably counteracting the pivotal movement of said boom structure to maintain said boom structure substantially level with respect to the ground.

4,344,573

SPRAY APPLICATOR

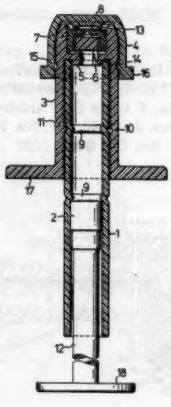
Wilfried De Felice, Kelkheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 6, 1980, Ser. No. 156,922

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1979, 7916475[U]

Int. Cl.³ B05B *9/04*

U.S. Cl. 239—320 **5 Claims**



1. A disposable spray applicator for liquid or pulverulent medicaments comprising a receptacle cylinder divided axially into one or more dosing chambers, a piston plug disposed in said receptacle cylinder, spray head means disposed at one end of said receptacle cylinder, the spray head means surrounding the cylinder at said one end and having sealing means disposed therein sealably contacting the one end of the receptacle cylinder, and nozzle means connecting to the outside; at least one annular torus girdling said receptacle cylinder to divide the same into said dosing chambers and having an inner torus face and an outer torus face on the interior and exterior sides of said receptacle cylinder, respectively; at least one mating torus in said piston plug to catch said inner torus face at the end of a predetermined dosage; and at least one mating torus in said spray head means mating with said outer torus face to ensure that the receptacle cylinder, when inserted into said spray head means, is secured therein.

4,344,574

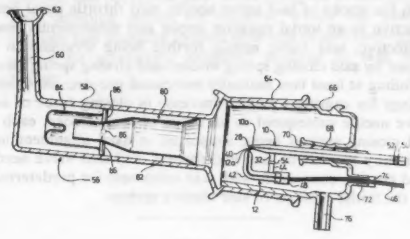
CROSS-FLOW NEBULIZER

Basil Meddings, Edmonton, and Heinz Kaiser, Fort Saskatchewan, both of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Oct. 26, 1979, Ser. No. 88,491

Int. Cl.³ B05B *7/26*

U.S. Cl. 239—338 **14 Claims**



1. A method of making a cross-flow nebulizer comprising providing first and second deformable glass tubular members each having a substantially constant external diameter and a central passage of substantially constant diameter extending from a forward end to a rearward end, said external diameter being from about 5 mm to about 7 mm and said passage diameter being from about 0.5 mm to about 1.0 mm, deforming a forward end portion of each tubular member to provide the forward end with an orifice of reduced diameter from about 0.02 mm to about 0.4 mm, positioning the forward end portions of the tubular members in an angular spaced relationship with the orifices closely adjacent, connecting one tubular member to a source of liquid and passing a gas through the other tubular member to cause a spray to be emitted from said one tubular member, adjusting the relative positions of the orifices to a spacing from about 0.01 mm to about 0.15 mm to provide a satisfactory spray, and integrally connecting the glass tubular members by fusion to maintain the forward ends in the adjusted position.

4,344,575

FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

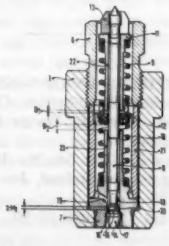
Kurt Seifert, Esslingen-Zollberg, Fed. Rep. of Germaay, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 24,818, Mar. 28, 1979, abandoned. This application Nov. 26, 1980, Ser. No. 210,638

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1978, 2825982

Int. Cl.³ B05B *1/30*

U.S. Cl. 239—533.5 **4 Claims**



1. A fuel injection nozzle for internal combustion engines comprising a nozzle body, a bore in said nozzle body, an insert

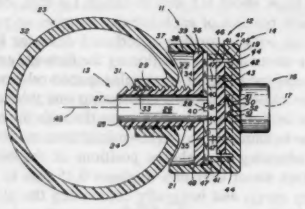
including a valve seat disposed in said nozzle body on an outer end of said bore, said insert including a tubular body extension, a valve needle guided by said tubular body extension, said valve needle having a terminal head portion which cooperates with said valve seat for fuel passage, said valve needle adapted to open in the fuel flow direction against the force of a closing spring means, said valve needle further including an annular cylindrical shoulder positioned upstream of said terminal head portion in cooperation with said tubular body extension to form a throttle point for controlling fuel flow in accordance with the stroke of said valve needle, said throttle point being effective in an initial opening stroke and subsequently made ineffective, said valve needle further being arranged to be loaded by said closing spring means, said closing spring means including at least two mutually associated pre-stressed closing springs for causing a sudden increase in closing force of said valve needle subsequent to an initial opening stroke, each of said closing springs being supported in axial alignment in a stationary manner on one end thereof, and said valve needle head portion cooperates with said valve seat for predetermining the initial position of said closing springs.

4,344,576

TRICKLE FLOW IRRIGATION VALVE

Allan L. Smith, 26591 Rd. 196, Exeter, Calif. 93221

Filed Sep. 15, 1980, Ser. No. 187,057
Int. Cl.³ B05B *15/00*
U.S. Cl. 239—542 **5 Claims**



1. A pressure compensating emitter for fluid comprising a housing having inlet and outlet ports communicating with a pressurizable internal chamber having a predetermined dimension, a wall containing said outlet port facing said chamber and having a channel therein interconnecting the outlet port and the periphery of the wall at an entrance for the channel and being of a shorter length than said predetermined dimension of the chamber; and an unattached flexible wafer within said chamber having a corresponding dimension less than said predetermined dimension of the chamber and sufficiently greater than the length of the channel to be movable within the chamber in response to fluid pressure to free the emitter of foreign substances while overlaying said channel and outlet port in all positions when the chamber is pressurized to define with said channel a passage for fluid to the outlet port of constant length.

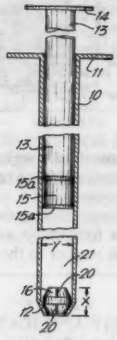
4,344,577

CONSTRUCTION OF NOZZLE

James J. Gilson, Dublin Rd., Skerries, County Dublin, and Richard B. Barrett, Inishduff, Dargle Rd., Bray, County Wickow, both of Ireland

Filed Jun. 27, 1980, Ser. No. 163,636
Claims priority, application Ireland, Jun. 29, 1979, 465/79; Sep. 26, 1979, 1831/79
Int. Cl.³ B05B *15/00*
U.S. Cl. 239—546 **7 Claims**

1. A nozzle device for providing a high discharge velocity of a fluid fed to the nozzle, comprising: a pipe having an orifice at one end, at least the portion of the pipe adjacent said one end being internally tapered towards the orifice, and an unattached and freely displaceable insert member having an externally tapered portion defining one of a truncated cone and a conical surface adapted to mate with a correspondingly configured internally tapered surface of the nozzle orifice, at least one of the internally tapered end portion of the pipe and the externally tapered portion of the insert member having at least one surface groove establishing fluid communication between the



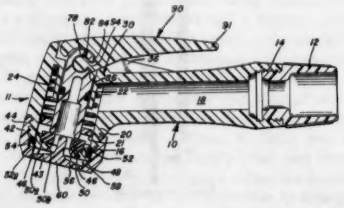
interior of the pipe and the exterior thereof, wherein the pipe is of circular cross-section and the insert member comprises a pair of cone portions extending in opposite directions longitudinally of the pipe, the angle of taper of each cone portion being complementary to the angle of taper of the end portion of the pipe, and the insert member being located in the pipe with one of the cone portions engaging the internally tapered end portion.

4,344,578

HANDLED SPRAY

Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502

Filed Nov. 25, 1980, Ser. No. 210,310
Int. Cl.³ B05B *1/30*
U.S. Cl. 239—583 **9 Claims**



1. In a handled spray that is provided with a lever operated flow control, the improvement comprising, in combination:

an elongated tubular molded body shaped to define thereon upstream and downstream concentric sleeves, with molded thread attachment means on said downstream sleeve;

a molded elongated flow control spool member shaped at its upstream end to provide means for cooperation with said lever, and shaped at its downstream terminus to provide thereon an annular rigid seal element;

an O-ring seal carried on the flow control spool member spaced downstream of said means for cooperation with said lever for effecting a slidable seal with the inner wall of said upstream sleeve;

abutment means on said flow control spool member adjacent

to but spaced upstream of said downstream terminus of said spool member and extending radially outwardly of a downstream projection of the upstream sleeve;

an elongated compression coil spring surrounding the upstream sleeve with one end in force transfer relation to said molded body and the other end engaging said abutment means on the flow control spool member to normally bias said spool member downstream;

a cup-shaped closure for the discharge end of the molded body shaped to provide in the cup's bottom wall a plurality of spaced, discrete, jet-forming apertures, and attachment means on the cup's sidewall adapted for selective connection to said attachment means on the downstream sleeve of said molded body;

an annular rigid insert carried in said cup-shaped closure and spaced from said cup's bottom wall to provide a radially enlarged flow chamber whose inlet is the central opening of the annular insert and whose outlets are said plurality of jet-forming apertures; and

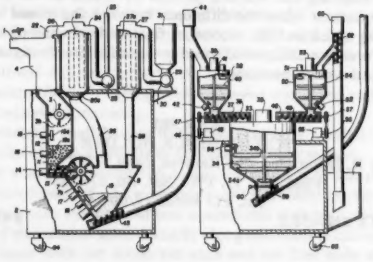
said annular insert carrying a pair of concentric seals, the outer one of said concentric seals being positioned to effect resilient sealing engagement between the insert and the cup-shaped closure and between said insert and the downstream terminus of the molded body when the closure is secured to the molded body, and the inner one of said concentric seals being an annular body positioned to receive thereagainst, in sealing engagement, the downstream edge of the spool member under the bias of said coil spring.

4,344,579

APPARATUS FOR RECLAIMING AND RECYCLING THERMOSETTING SCRAP

Riyozo Morita, and Yutaka Honjyo, both of Nagoya, Japan, assignors to Kabushiki Kaisha Meiki Seisakusho, Aichi, Japan

Filed Sep. 6, 1977, Ser. No. 830,893
Claims priority, application Japan, Sep. 3, 1976, 51/106057
Int. Cl.³ B02C *13/286*
U.S. Cl. 241—34 **6 Claims**



1. An improved apparatus for reclaiming and recycling thermosetting plastic scrap which comprises:

a pulverizer for grinding said scrap to provide pulverized scrap material,

an atomizer for grinding said pulverized scrap material to provide atomized material,

a feeding means to supply said pulverized material to said atomizer,

a dust collecting device which collects the dust generated in the air during the grinding process in said pulverizer,

a purifying means for noxious gases generated,

a conveying means for conveying said atomized material to a first hopper,

a first feed cylinder beneath said first hopper containing a feed screw and means to run said feed screw at a constant speed,

a second hopper for virgin material,

a second feed cylinder beneath said second hopper containing a variable speed feed screw,

a third hopper for receiving a mixture of said atomized material from said first feed cylinder and said virgin material from said second feed cylinder, and

means to control the ratio of atomized material and virgin material discharged into said third hopper by controlling the speed of said variable speed feed screw;

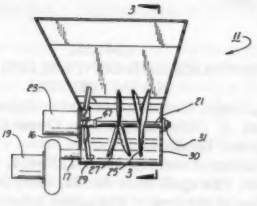
further comprising means to hold material which has passed through said pulverizer and before being fed to said atomizer; retaining means for material which has passed through said atomizer located upstream of said conveying means for conveying atomized material to said first hopper.

4,344,580

FIBROUS MATERIAL APPARATUS

Thomas C. Hoshall, 4005 N. Pennsylvania, Oklahoma City, Okla. 73112; LaVern L. Hicks, 117 Parkland Dr., Yukon, Okla. 73099, and Larry Renth, 4825 NW. 75th, Oklahoma City, Okla. 73132

Filed Apr. 14, 1980, Ser. No. 139,885
Int. Cl.³ B02C *18/00*
U.S. Cl. 241—60 **6 Claims**



1. A device for dispensing fibrous material comprising:

centrifugal blower means having a radially offset inlet port and an outlet port;

a housing having a reservoir disposed therein for containing the fibrous material to be dispensed and a lower passageway which communicates said reservoir to said blower means inlet port;

at least one auger disc consisting of a sliced and spread disc having a toothed edge rotatably mounted and disposed in said reservoir approximately adjacent said passageway;

a bar extending across said reservoir parallel to the axis of rotation of said at least one auger disc and spaced adjacent said auger disc such that, as gravity urges fibrous material toward said auger disc and said auger disc rotatingly encounters said fibrous material, said bar presents an obstacle to fibrous material which is carried by said auger disc;

a ramp member extending from said bar upward to a side of said reservoir such that fibrous material above said bar is urged by gravity downwardly toward said auger disc; and

means for rotating said auger disc such that insulation material encountered by said rotating auger disc is urged toward said passageway.

4,344,581

CRUSHING APPARATUS

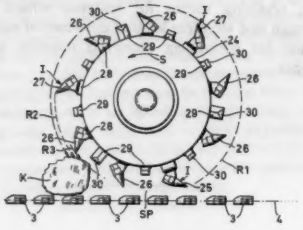
Richard Redemann, Lunen, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Fed. Rep. of Germany

Filed Nov. 20, 1979, Ser. No. 97,111

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1978, 2852662

Int. Cl.³ B02C *19/00*

U.S. Cl. 241—88.4 **16 Claims**



1. Apparatus for crushing mineral material, the apparatus comprising:

(a) a rotary crusher disposed above, and cooperating with, a floor plate,

(b) the rotary crusher including a cylindrical body and a plurality of chisels detachably fixed thereto,

(c) the chisels being arranged in rows with at least one row of the chisels having a first radial reach followed by two adjacent rows of the chisels having a radial reach shorter than the first radial reach,

(d) in each row having chisels of the longer first radial reach, said chisels having differing radial reaches with respect to each other.

4,344,582

MICROPROCESSOR-CONTROLLED PRODUCT ROVING SYSTEM

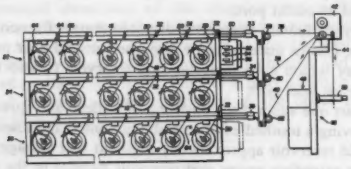
Kenneth L. Rapp, Granville, and Walter Zolnerovich, Jr., Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 958,582, Nov. 7, 1978, Pat. No. 4,269,368. This application Jul. 24, 1980, Ser. No. 171,767

The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.

Int. Cl.³ B65H *54/02, 59/00*

U.S. Cl. 242—45 **5 Claims**



1. A method of controlling the winding of products in a roving process with a microprocessor wherein a creel contains a plurality of operating strands which are wound together in a group on a collet to form a product, said method comprising the steps of:

(a) storing a plurality of desired winding data sets in a microprocessor, each of said sets of desired winding data corresponding to a different product required to be formed by the roving process, a desired set of winding data including:

(1) a first rate of change of velocity or acceleration to accelerate the collet from an initial zero velocity to a first predetermined velocity for a given product to be wound;

(2) a second rate of change of velocity or acceleration to accelerate the collet from the first predetermined velocity to a second or normal desired operating speed for a given product to be wound;

(3) a differential speed error value at which the microprocessor cannot correct the collet speed to produce an acceptable formed product and should stop the winding process; and

(4) the number of strands required for a given product to be wound;

(b) selecting particular desired set of winding data from the microprocessor based upon the particular product to be formed;

(c) sensing the number of strands available to be wound and comparing this number with the number of strands previously stored in the microprocessor as part of a desired winding data set for the particular product to be formed;

(d) indicating by means of the microprocessor that the number of strands are incorrect for the product being wound or that the number of strands are correct and the winding process can be started;

(e) starting the winding process and accelerating the collet with a first rate of change of velocity previously stored in the microprocessor to a first predetermined velocity;

(f) sensing the winding speed of the winder;

(g) comparing in the microprocessor the sensed winding speed of the winder with the first predetermined velocity previously stored in the microprocessor;

(h) changing the acceleration of the collet by means of the microprocessor to a second rate of change of velocity when the first predetermined velocity has been reached;

(i) comparing in the microprocessor the sensed winding speed of the winder with the second or normal desired operating speed;

(j) maintaining by means of the microprocessor the second or normal desired operating speed and modifying the winding speed when the difference between the sensed winding speed and the second or normal desired winding speed exceeds a predetermined amount; and

(k) stopping the winding process by means of the microprocessor when the difference between the sensed winding speed and the second or final desired winding speed exceeds a differential speed error value previously stored in the microprocessor.

4,344,583

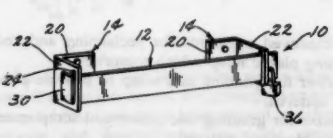
TOILET TISSUE HOLDER

Harry R. Drum, Box 430, Ruthven, Iowa 51358

Filed Aug. 11, 1980, Ser. No. 177,195

Int. Cl.³ B65H *19/00*

U.S. Cl. 242—55.2 **2 Claims**



1. A toilet tissue holder comprising,

a pair of substantially identical oppositely disposed spaced apart rigid L-shaped metal plate members and each having one leg adapted to be secured to a wall or other supporting structure in either a righthanded or lefthanded position, with the other leg extending perpendicularly thereto, said other leg having an elongated slot adjacent its outer end, and

a rigid metal plate bar being L-shaped at one end extending through said slots in the other legs of said L-shaped metal plate members with said L-shaped one end engaging the

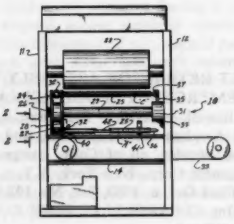
adjacent other leg to limit movement in one direction through said slot, and the opposite end of said bar having an aperture for receiving a lock to limit movement of said bar in the opposite direction, when said holder is in use and when said holder is being refilled, and said lock is removed said bar may be moved in said slots in the opposite direction to disengage said opposite end of said bar from the slot in the adjacent other leg of said L-shaped plate member.

4,344,584

APPARATUS FOR WINDING WEBS

Roger A. Schroeder, Green Bay, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Mar. 4, 1981, Ser. No. 240,110
Int. Cl.³ B65H *19/06, 19/26*
U.S. Cl. 242—56 A **11 Claims**



1. In apparatus for winding webs into rolls, wherein a web is fed onto a core carried by one of a plurality of a mandrels, each supported at one end on an incrementally rotatable turret operative to move the mandrels in an orbital travel path between at least core loading, operational, and wound-roll unloading stations, said mandrel having non-supported free ends in said loading and said unloading stations, and support means movable into supporting engagement with said free ends as said mandrels are indexed from said loading station toward said operational stations, and wherein said non-supported mandrels are succeptible of sagging relative to the supported ends, the improvement comprising:

a rotatable shaft having its axis substantially parallel to the axes of said mandrels in said core loading station,

said shaft being disposed in spaced relation to the orbital travel path of said mandrels as they are indexed between said core loading and said operational stations; and a pair of star wheels spaced axially along said shaft in correspondence with the supported ends and the free ends of said mandrels,

each said star wheel including a plurality of equally angularly spaced, generally radially outwardly presented pockets,

said pockets in one rotational position of said shaft being positioned and arranged to receive a mandrel as it is indexed between a core loading station and on operational station,

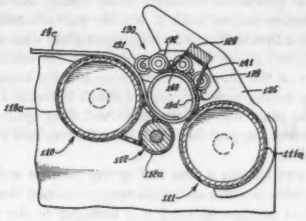
said shaft being rotatable while said mandrel is in said pockets until such position of said mandrel is reached that the sagging free end thereof is elevated by its corresponding star wheel into a position substantially aligned with and to be engaged by provided latching means for holding it in said operational stations, said star wheels being positioned and arranged to release said engaged mandrel and to receive in a successive set of pockets the next successive mandrel as it is moved from the core loading station.

4,344,585

SHEET HANDLING APPARATUS

Robert B. Eglinton, Huntington Beach, Calif., assignor to Paxall, Inc., Chicago, Ill.

Filed Mar. 7, 1980, Ser. No. 128,025
Int. Cl.³ B65H *17/12*
U.S. Cl. 242—66 **10 Claims**



1. In rollable sheet handling apparatus, and wherein a sheet is subject to advancement in a generally longitudinally forward direction,

(a) means to receive the advancing sheet and to roll same,

(b) said means including support means over which the sheet travels, and auxiliary means including swingable arm means and rollers carried by the arm means to be movable between rearwardly collapsed position in which rolling of the sheet extent adjacent the support is initiated, and a series of forwardly extended positions in which rolling of the sheet is guided toward completion, and while the rollers engage the sheet extent being rolled,

(c) said rollers being spaced to extend about, in roll forming relation, a portion of the sheet extent initially being rolled,

(d) said rollers being clustered in groups which are laterally spaced apart, each roller group defining a concave zone facing the sheet as it is initially coiled, to receive and shape the coil,

(e) said support means including multiple elongated rolls to support the sheet as it is initially coiled and subsequently rolled up, one of the rollers in each clustered group holding the sheet against one of the support rolls during initial coiling of the sheet,

(f) said auxiliary means including shields carried by the arm means to be laterally spaced apart and located between and spaced from said clustered roller groups, to project in the path of sheet advancement and co-operate with rollers of said clustered groups in initiating coiling the sheet, the shields being concave toward the sheet,

(g) another of said elongated rolls being spaced forwardly of said one roll and having fixed position, there being sheet gripping annuli on said other roll, and wherein said shields carried by said arm means initially project in the path of sheet advancement toward said other roll and closer to said other roll than the surfaces of said sheet gripping annuli, said shields carried by said arm means to swing about an axis defined by said other roll.

4,344,586

DRAG SPRING FOR FISHING REEL

John W. Puryear, Tulsa, Okla., assignor to Brunswick Corporation, Skokie, Ill.

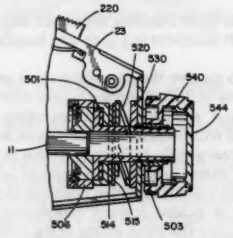
Continuation of Ser. No. 136,379, Apr. 1, 1980, abandoned, which is a continuation of Ser. No. 932,845, Aug. 11, 1978, abandoned. This application Jun. 29, 1981, Ser. No. 278,178
Int. Cl.³ A01K *89/02*
U.S. Cl. 242—84.5 A **1 Claim**

1. In an open face spinning reel used for casting a bait attached to a fishing line and for retrieving the bait and fishing line after casting, the reel having a housing with a hole at the back thereof, a center shaft mounted in the housing a spool mounted on the shaft for holding the fishing line, a handle and

gear train assembly mounted in the housing, a rotor coaxially mounted on the shaft and rotatable by cooperative movement of the handle and assembly, and a movable bail mounted on the rotor having an open casting position and a closed retrieving position, a free-floating drag assembly keyed to the shaft to permit limited rotation thereof, as the drag is tightened the shaft is permitted to rotate less, and as the drag is loosened the shaft is permitted to rotate more freely, the drag having an adjustment screw with a washer portion and an elongated shank, a first disc and an alignment plate disc mounted on the shank, the shank extending through the back housing hole, means on the shank for tightening and for loosening the drag, a drag spring mounted on the shank between the first washer and the plate washer, the improved drag spring comprising:

a center support having a hole therein and mounted on the shank;

an arm having a first leaf spring portion and a second leaf spring portion and a fulcrum positioned therebetween, the first portion secured at a first end to the center support



and extending radially and bent axially therefrom, and a second end secured to the fulcrum, the second leaf spring at a first end secured to the fulcrum with a second end extending freely and axially back toward the center support when the drag is loosened, the fulcrum axially spaced from the center support when the drag is in the loosened position, the center support being in contact with the plate disc and the fulcrum in contact with the first disc creating a light force on the drag in the loosened position; tightening the drag from the loosen position deflects the first portion linearly and creates an increased force on the drag that prevents the shaft from rotating, and continued tightening of the drag causes the second end of the leaf spring to contact the first washer providing for dual spring contact comprising the first and second leaf spring portions coacting to create an increased linear force on the drag thus further limiting the ability of the shaft to rotate; the second leaf spring portion having a linear force independent of the first portion.

4,344,587

AUTOMATIC MOTORIZED FISHING REEL

W. C. Hildreth, 331 NW. Sherbrooke Ave., Port St. Lucie, Fla. 33542

Continuation-in-part of Ser. No. 896,716, Apr. 17, 1978, abandoned. This application Aug. 14, 1979, Ser. No. 66,406

Int. Cl.[3] **A01K** *89/017, 89/02;* **B66D** *1/14*

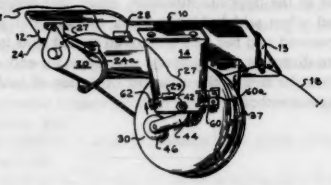
U.S. Cl. 242—106 **12 Claims**

12. An automatic motorized fishing reel comprising in combination:

a spool for receiving fishing line thereon when rotated in a first direction;

drive means for rotating said spool in said first direction;

clutch means, operatively coupled to said spool and to said drive means, for disengaging in a first condition said spool from said drive means, with said clutch means including first and second surfaces thereon for releasibly engaging with each other when said clutch means is in a second condition so as to engage said drive means with said spool for producing rotation thereof in said first direction; and



clutch control means including fluid means juxtaposed between said first and second surfaces for transferring torque therebetween so as to switch said clutch means between said first and second conditions.

4,344,588

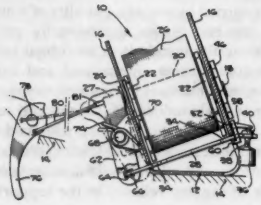
SEAT BELT RETRACTOR ASSEMBLY WITH POST EMERGENCY SPOOL RELEASE

William Hollowell, Pacific Palisades; Akira Tanaka, Northridge; Avraham Ziv, Sepulveda, and Nazareth Stamboulian, Los Angeles, all of Calif., assignors to American Safety Equipment Corp., New York, N.Y.

Filed Oct. 6, 1980, Ser. No. 193,957

Int. Cl.[3] **A62B** *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.4 A **11 Claims**



1. In an emergency locking seat belt retractor mechanism including a belt winding spool, at least one spool associated ratchet member having a plurality of ratchet teeth, locking pawl means mounted for engaging the ratchet teeth of said ratchet member on actuation thereof, and emergency responsive means for automatically actuating said pawl means to lock said spool via said ratchet member, the improvement in locking pawl means comprising:

said locking pawl means having a longitudinal axis mounted within said seat belt retractor mechanism for freedom of motion rotationally around the longitudinal axis thereof and freedom of motion transversely along the longitudinal axis thereof,

manual unlocking means,

said emergency responsive means automatically actuating said locking pawl means into said rotational motion to engage said locking pawl means with said ratchet teeth; and

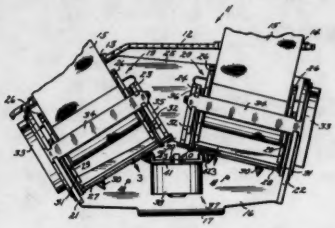
said manual unlocking means manually actuating said locking pawl means into said transverse motion to disengage said locking pawl means from said ratchet teeth, thereby manually unlocking said emergency locking seat belt retractor in a post emergency.

4,344,589

TANDEM DUAL SPOOL RETRACTOR STRUCTURE

Robert J. Rumpf, Grosse Pointe, Mich., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Oct. 23, 1980, Ser. No. 200,030
Int. Cl.[3] A62B *35/02;* B65H *75/48*
U.S. Cl. 242—107.4 A 7 Claims



1. A tandem dual spool retractor having a pair of spaced-apart and non-aligned askew webbing spools each having separate rewind mechanisms and non-aligned pawls projecting generally towards each other and each mounted for tilting movement into lock engagement with its associated spool, the combination comprising:

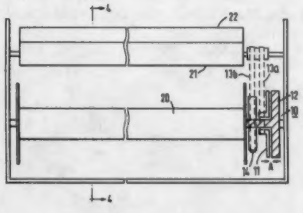
an inertial sensor below and intermediate said spools; a liftable lever element journalled for pivotal and vertical movement in two spaced-apart journals having vertically elongated slots, said sensor upon displacement by inertia elevating said lever element to substantially simultaneous engagement with said pawls and tilting said pawls into lock engagement against said spools.

4,344,590

TORQUE LIMITING DEVICE

Terence F. Dean, High Wycombe, England, assignor to EMI Limited, Hayes, England

Filed Jul. 3, 1980, Ser. No. 165,717
Claims priority, application United Kingdom, Jul. 7, 1979, 7923800
Int. Cl.[3] G03B *1/04;* G11B *15/32*
U.S. Cl. 242—201 6 Claims



1. A spooling device for use in a recording apparatus having a drive means for transporting recorded paper or tape to an output location, the device comprising:

a rotary bearing for a spool,

means for supporting the bearing adjacent the output location at a position appropriate for spooling transported paper or tape,

a constant torque clutch and an over-running clutch each having a driving member and a driven member, the driven members being coupled to the bearing and the driving members being adapted to be driven by the drive means,

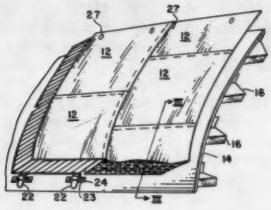
wherein the over-running clutch is capable of transmitting to said bearing a torque substantially greater than the maximum torque provided in operation by the constant torque clutch, and adopts the free-running mode when the transport speed of the paper or tape attains a preselected value substantially less than the maximum attainable transport speed.

4,344,591

MULTIWALL THERMAL PROTECTION SYSTEM

Liam R. Jackson, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 5, 1979, Ser. No. 72,857
Int. Cl.[3] B64C *1/58*
U.S. Cl. 244—158 A 15 Claims



1. A thermal protection sandwich panel adapted to serve as an exterior heat shield insulating tile in the thermal protection system of a hypervelocity vehicle or other enclosure comprising:

an outer skin for the sandwich panel,

an inner skin for the sandwich panel spaced from said outer skin,

side skins sealingly attached to said inner and outer skins to form a unitary panel structure,

at least one intermediate thermal protective layer of material confined within the space bounded by said outer skin, said inner skin and said side skins,

said at least one intermediate thermal protective layer of material being attached to at least one of said inner and outer skin,

means secured to said inner skin for mechanically attaching the unitary panel structure to a hypervelocity vehicle or other enclosure

said means secured to said inner skin for mechanically attaching the unitary panel structure to a hypervelocity vehicle including a pair of tab extensions extending one each from adjacent corners of said panel and a pair of open panel clips disposed one each on the corners of said panel opposite to said tabs, and

connecting clips provided on the vehicle surface and equal in number to and adapted to receive said tab extensions, said tab extensions, said tab extensions being of adequate length to extend through said connecting clips and also be received by the said panel clips of an adjacent panel.

4,344,592

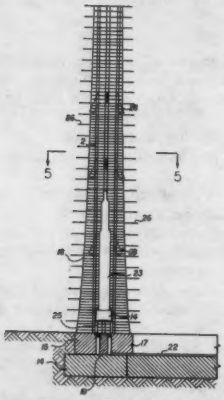
LAUNCHING TOWER FOR HEAVY ROCKETS

Spiridon Constantinescu, 161 Violet Dr., Stoney Creek, Ontario L8E 3J2, Canada

Continuation of Ser. No. 850,227, Nov. 10, 1977, abandoned. This application Jul. 22, 1980, Ser. No. 171,240
Int. Cl.[3] B64F *1/04;* F41F *3/04*
U.S. Cl. 89—1.805 2 Claims

1. A launching tower for heavy rockets, comprising in combination steel columns shaping a polygonal structure with a central shaft several times deeper than the height of a heavy rocket; a basement of reinforced concrete having a central chamber and a series of lateral chambers; a reinforced concrete slab over said basement; a plurality of holes in said reinforced

concrete slab above said central chamber; a cluster of liquid-propellant motors mounted inside said central chamber, said liquid-propellant motors having their nozzles aimed upward though said holes of said reinforced concrete slab; said lateral chambers being for storage of liquid-propellants and for control equipments of said liquid-propellant motors; a plurality of series of windows disposed between said columns and all along said launching tower; frames of said windows bracing said columns; a shutter for each said window; rams for each said shutter mounted inside said columns and closing or opening said shutter at command; a piston bearing said heavy rocket inside said shaft of said launching tower; bearings supporting said piston in said shaft at an appointed height from said reinforced concrete slab; said piston having its bottom concave and being framed inside by dyaphragms; a plurality of wheels mounted in a vertical series outside said piston, one series of wheels for each said column; a central part and two equal side-parts of said piston being solidly jointed between them inside said shaft and forming together with a heavy rocket a first couple; said side-parts of said piston being separated by a distance approximately equal to the biggest diameter of a heavy rocket; said central part of said piston forming together with a heavy rocket a second couple; a plurality of wings made of steel plates bracing said columns; said wings being disposed on horizontal planes spaced not more than the height of said



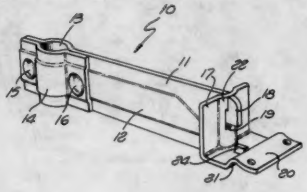
piston and extending outside of said launching tower; a plurality of circular plates being disposed horizontaly inside said shaft one for each said frame of said windows and one for each said wing; said circular plates shaping concentric circles inside said shaft close to the vertical series of wheels of said piston; brushes provided on all said circular plates wiping said piston in its rising movement; rail-ways mounted one on each said column and guiding said series of wheels of said piston; a plurality of clusters of solid-propellant motors mounted inside said columns; each of said cluster of solid-propellant motors having one motor in each said column at the same level and dividing said launching tower in stages of thrust: said solid-propellant motors of one said cluster being aimed upward and providing at their level when necessary a cone of ejecting gases; a tower gate, its height being as big as to receive inside said shaft said second couple at the level of said bearings; a mobile basement of said tower gate provided with wheels; a platform provided with a plurality of rail-ways for moving said mobile basement to cause the opening or closing of said tower gate; a plurality of rolling girders which are temporary setting on the rail-ways of said platform when said tower gate is open; a rolling bridge sliding on said rolling girders between said launching tower and said open tower gate; a turn-table mounted on said rolling bridge receiving said second couple; said turn-table turning around 90 degrees and allowing said second couple to get in said shaft where are awaiting said side-parts of said piston to be solid jointed to said central part of said piston to form said first couple.

4,344,593

SUPPORT FOR HORIZONTAL PIPE OR THE LIKE

Gabriel F. Canto, 11409 Bombardier Ave., Norwalk, Calif. 90650

Filed Sep. 15, 1980, Ser. No. 186,968
Int. Cl.³ F16L *3/08*
U.S. Cl. 248—73 **9 Claims**



1. A support device for horizontal runs of pipe or the like, comprising;

generally flat stip having its width dimension in a vertical plane, said stip being elongated to form a generally horizontal strut having a support end and a cantilevered end;

first means for attaching said strut to a generally vertical support at said support end;

second means comprising a nose projecting longitudinally outward from said strut cantilevered end, said nose being adjacent the top of said strut cantilevered end, said strut further including a notch in the top edge of said strut adjacent to the attachment of said nose to said strut;

third means comprising a bracket having first and second generally perpendicular legs, said first leg being generally vertical and including a generally vertical first slot, said first slot accepting said strut nose, said bracket seating downward into said notch; and

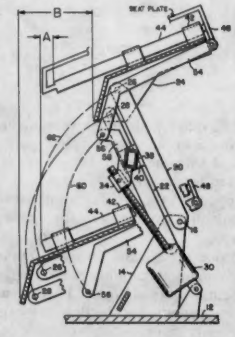
fourth means comprising means within said bracket second leg for mounting at least one elongated horizontal member to be supported, said horizontal member being a pipe or the like.

4,344,594

LIFT MECHANISM FOR DENTAL CHAIR

Emil Hirth, Malsch, Fed. Rep. of Germany, assignor to Sybron Corporation, Rochester, N.Y.

Filed May 15, 1980, Ser. No. 149,907
Int. Cl.³ A47C *1/02*; A61G *15/00*
U.S. Cl. 248—421 **6 Claims**



1. In a dental chair having a fixed base, a support frame for

carrying the seat of the chair and a parallel motion linkage including upper and lower parallel members each pivotally connected at their ends to the base and the support frame respectively and motor means operatively connected to the parallel motion linkage for moving the support frame about the base between a low and a high position wherein the frame moves forward with respect to the base as the frame goes to the high position and wherein the frame moves rearward with respect to the base as the frame goes to the low position, the improvement comprising:

(a) spaced front and rear bearings on said support frame;

(b) a rod for carrying the seat of the chair, said rod extending slidably through said bearings for movement relative to said support frame;

(c) drive means for moving said rod relative to said support frame in a forward or rearward direction counter to the motion of said support frame, said drive means including an elongated drive link having a first end pivotally connected to the forward end of said rod and having its second end pivotally connected to one member of said parallel motion linkage intermediate the ends thereof.

4,344,595

AUXILIARY APPARATUS AT A STAND FOR AN OPTICAL OBSERVATION DEVICE

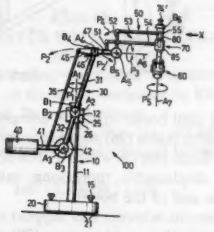
Rudolf Heller, and Walter Schindler, both of Zürich, Switzerland, assignors to Contraves AG, Zürich, Switzerland

Filed Jul. 10, 1980, Ser. No. 167,540

Claims priority, application Switzerland, Jul. 24, 1979, 6849/79

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—542 **6 Claims**



1. An auxiliary apparatus for a stand for an optical observation device, preferably a surgical microscope, comprising:

said stand containing:

a support arm;

a pivotable arm cooperating with said support arm;

hinge parallelogram means rotatable about a first axis;

said hinge parallelogram means being pivotable about a second axis of the support arm which is transversely arranged with respect to the first axis;

a number of rotatary and brake bearings;

the optical observation device being mounted at the stand and being freely adjustable, but fixedly positionable, in a predetermined spatial region as concerns its position and orientation;

said hinge parallelogram means having a front region at which there is arranged one of the brake bearings;

a levelling element provided at said one brake bearing which is arranged at the front region of the hinge parallelogram means;

a head element mounted to be rotatable in relation to the brake bearing about an essentially vertical axis;

said head element having a housing;

a coupling element provided at said head element;

said coupling element serving for receiving and attaching the observation device;

said coupling element being mounted to be freely movable in said housing of said head element;

fixing screw means for fixedly positionally adjusting said coupling element;

ball-and-socket joint means for mounting said coupling element in said housing of said head element;

said fixing screw means serving to fixedly positionally adjust said coupling element which is freely movable within the mobility limits of said ball-and-socket joint means; and

said brake bearing being arranged to be adjustable in horizontal direction, together with the head element and coupling element, in relation to a horizontal axis of the support arm and in vertical direction at the hinge parallelogram means.

4,344,596

ADJUSTABLE ROLLER SUPPORT FOR A ROTARY DRUM

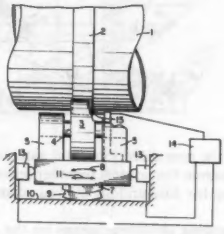
Paul T. Hjaeresen, Hillsdale, N.J., assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed May 5, 1980, Ser. No. 146,222

Claims priority, application United Kingdom, May 9, 1979, 7916050

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—550 **16 Claims**



1. A roller support for supporting a rotary drum on a base support, the rotary drum having a live ring positioned around the rotary drum, comprising at least one roller in supporting engagement with the live ring, weigh beam means, means for mounting the at least one roller on the weigh beam means, rocking bearing means positioned between the weigh beam means and the base support, said rocking bearing means being configured and dimensioned so as to permit rocking movement of said weigh beam means and also longitudinal movement of the roller support generally along the direction of the longitudinal axis of the rotary drum, and means for driving the roller support in accordance with the axial displacement of the live ring.

4,344,597

VEHICLE SEAT WITH FORE-AND-AFT SHOCK ISOLATION

Shawn H. Eimen, Milwaukee, Wis., assignor to Milsco Manufacturing Company, Milwaukee, Wis.

Filed Apr. 21, 1980, Ser. No. 142,339

Int. Cl.³ F16F *15/06*

U.S. Cl. 248—561 **4 Claims**

1. A seat suspension having a seat part supported on a suspension part for fore-and-aft motion relative to the suspension part, said seat suspension being characterized by:

A. a latching member;

B. cooperating means on the seat part and on said latching member connecting the latter with the seat part

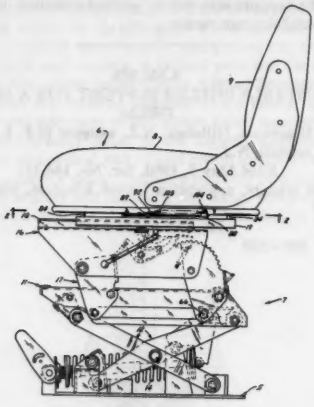
(1) to swing relative thereto about a first axis, between a normal position wherein a latch part on the latching member engages said suspension part to confine the

latching member against fore-and-aft movement relative to the suspension part and a releasing position wherein said latch part is disengaged from the suspension part, and

(2) said cooperating means providing for limited fore-and-aft sliding of the seat part relative to the latching member when the latter is in its normal position;

C. a manually shiftable control member;

D. pivot means connecting said control member with the latching member for swinging relative thereto about a second axis which is spaced from and parallel to said first axis, whereby said control member is carried between an intermediate position and a first limit position which is



spaced in one direction from said intermediate position and wherein the control member leaves the latching member free for fore-and-aft sliding relative to the seat part; and

E. cooperating abutment means on the seat part and on the control member, engaged when the control member is in its said intermediate position to confine the control member against fore-and-aft movement relative to the seat part to thus lock the latter to the latching member, said abutment means providing a fulcrum about which the control member can be swung in the opposite direction, from its intermediate position to the second limit position, while said pivot means constrains the latching member to swing to its releasing position.

4,344,598

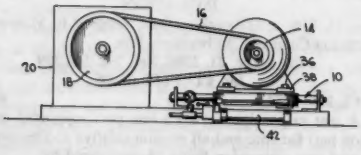
MOTOR SUPPORT

Jerome J. Sloyan, Trenton, N.J., assignor to Joseph File and Seth A. Hubbard, both of Riverhead, N.Y.

Filed Oct. 5, 1978, Ser. No. 948,747

Int. Cl.³ F16M *1/00*

U.S. Cl. 248—651 **2 Claims**



1. A support for a motor having a drive pulley adapted to be connected by a belt to the driven pulley of a piece of machinery or the like comprising a base, a carriage slidable on the base and having an upper surface on which a motor is fixedly mounted, a fixed spring seat carried by the carriage, a hydraulic cylinder mounted on the base and having a piston rod workingly extending therefrom with the cylinder and the piston rod having their longitudinal axes aligned with the direction of sliding movement of the carriage, a movable spring seat carried by the piston rod, a spring assembly mounted between the seats with the movable seat being movable relative to the fixed seat in comprising the spring assembly, said spring assembly including guide rods fixed to the fixed seat and extending between the seats with the movable seat being slidable thereon and compression springs coiled on the guide rods and bearing against both seats, said piston rod having an outer end extension rod which extends lengthwise beyond the fixed seat and slidably passes through an end of the base, and an adjustably mounted stop on the extension rod disposed on the outer face of said base end with said stop engaging the base end to prevent retraction of the piston rod into the cylinder in the event fluid pressure should leak from the cylinder whereby release of compressive force on the spring assembly between the seats would be prevented should fluid pressure leak from the cylinder.

4,344,599

ROCK DRILL BOOM STRUCTURE

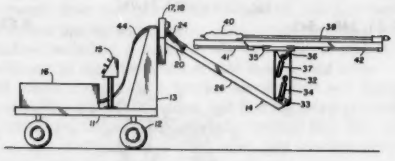
Lorne R. Herron, Saltsjöbaden, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Dec. 20, 1978, Ser. No. 971,446

Claims priority, application South Africa, Dec. 21, 1977, 777581

Int. Cl.³ F16M *1/00*

U.S. Cl. 248—660 **21 Claims**



1. In a rock drill boom structure comprising support means **(17)**, an elongated boom **(26)** swingably carried by said support means, a feed beam **(38)** on which a rock drill **(40)** is mountable to be power displaceable therealong, said feed beam being carried by one end of the boom,

the improvement wherein said support means **(17)** includes:

an elongated hollow guide means **(20)** which is of substantially less longitudinal length than the boom **(26)** and in which the boom is slidably received to project through both ends of said guide means, the boom being arrestable in said guide means;

a rotatable member **(19)** on which said guide means **(20)** is pivotally mounted so that said guide means **(20)** is pivotable relative to said rotatable member about an axis transverse to the axis of rotation of said rotatable member;

first power means **(23,24)** coupled to said guide means **(20)** to pivot said guide means; and

second power means **(63,77)** coupled to said rotatable member **(19)** to rotate said rotatable member.

4,344,600

MOLD FOR EMBEDDING ONE ARTICLE WITH ANOTHER

Gale E. Shafer, Jr., Rte. 3, Ottawa, Ohio 45875

Filed Feb. 9, 1981, Ser. No. 233,032

Int. Cl.³ B29C *1/14*; B29F *1/022*

U.S. Cl. 249—88 **4 Claims**

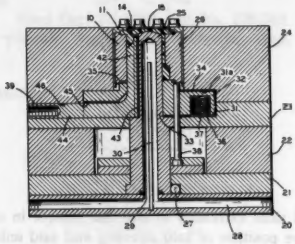
1. In an injection mold of the type having two halves movable toward and away from each other for bonding one member to another member with a matrix of material, one half comprising:

(a) a laminated mold structure having a cavity opening into

one surface thereof for receiving the members to be bonded to each other;

(b) a potting post fixedly connected to said laminated mold structure and projecting into the cavity for positioning the members to be bonded to each other relative to the cavity sufficient space being provided between said post and said member for introduction of molding material;

(c) ring means surrounding an intermediate portion of said potting post and movable relative thereto to define a



closed end of the cavity, said ring means having a portion extending into the cavity for supporting the one member to be bonded relative to the other member, and (d) means for urging said ring means toward the cavity opening in said one surface of said laminated mold structure, said ring means being movable in a direction opposite to said urging means whereby the shut height of the cavity between the opening and the ring means in said laminated mold structure is automatically adjusted to the height of the members, when the two mold halves are moved together.

4,344,601

MOLD APPARATUS WITH ELASTIC CLAMPING MEANS

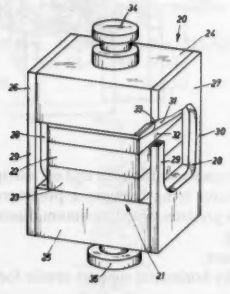
Lothar Fink, Achim-Baden, and Lothar Wojcichowski, Achim, both of Fed. Rep. of Germany, assignors to Klöckner-Werke AG, Duisburg, Fed. Rep. of Germany

Filed Mar. 16, 1981, Ser. No. 244,401

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1980, 3011200

Int. Cl.³ B29C *1/00*

U.S. Cl. 249—167 **16 Claims**



1. An apparatus for producing molded articles of plastic or rubber, comprising:

(a) a mold assembly including separable upper and lower mating parts defining therebetween a mold cavity,

(b) clamping means for holding the mold parts in an assembled state,

(c) elastically yieldable tensioning means embodied in and integral with the clamping means, and

(d) means for expanding the tensioning means to enable the separation of the mold parts, whereby the tensioning means exerts a closing force on the mold parts upon the release or relaxation of the expanding means.

4,344,602

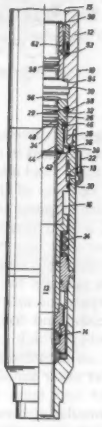
LOCK OPEN MECHANISM FOR SUBSURFACE SAFETY VALVE

Henry P. Arendt, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Oct. 16, 1980, Ser. No. 197,669

Int. Cl.³ E21B *43/12*

U.S. Cl. 251—58 **11 Claims**



1. A subsurface safety valve comprising

a tubular housing having a longitudinal bore extending therethrough defining a flow path,

closure means disposed in said bore for controlling flow through said flow path,

operator means longitudinally movable with respect to said tubular housing for moving said closure means and having a first position wherein said closure means closes said flow path and having a second position wherein said closure means opens said flow path,

control fluid pressure responsive means for moving said operator means from said first position to said second position when affected by fluid pressurized above a selected value,

biasing means for urging said operator means to move to its first position,

lock out means disposed in said bore, shiftable to act on said operator means to temporarily hold said operator means in said second position upon release of pressurization acting upon said control fluid pressure responsive means,

profile means on said lock out means for receiving a shifting tool,

a permanent lock out sleeve above said lock out means, and

latch means between said housing and said permanent lock out sleeve permitting downward movement while preventing upward movement of said sleeve,

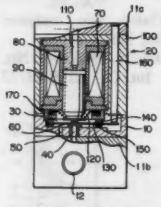
said permanent lock out sleeve movable downwardly into engagement with said lock out means to permanently hold said lock out means in a position to retain the operator means in said second position.

4,344,603

ELECTROMAGNETIC VALVE APPARATUS WITH A HAND-OPERATED TRANSFER DEVICE

Kazuhiro Hozumi, and Shigeo Tamaki, both of Asahi, Japan, assignors to Kuroda Precision Industries Ltd., Kawasaki, Japan

Filed Aug. 20, 1980, Ser. No. 179,642
Claims priority, application Japan, Aug. 31, 1979, 54-121286[U]
Int. Cl.³ F16K 31/06
U.S. Cl. 251—130 11 Claims



1. In an electromagnetic valve apparatus comprising a valve body, a valve chamber formed in the valve body and having a fluid inflow passage and a fluid discharge passage, a valve seat provided around an opening of the fluid inflow passage into the chamber, an electromagnetic member having a housing, an electromagnetic coil, a fixed iron core in which a fluid passage is provided, and a movable iron core, an end of the movable iron core being movable into contact with the valve seat to close the fluid inflow passage, the improvement comprising a hand-operated apparatus for moving the movable iron core away from the valve seat and comprising:

a flat spring member which comprises a large diameter annular element, an extended element which extends from the large diameter outer annular element and respectively projects to inner and outer sides thereof, and a small diameter inner annular element which is connected to an inner end of the extended element and is positioned within the outer annular element of the spring member;

elastic sealing means for fixedly securing the outer annular element of the spring member in the valve chamber; and

an operative member which operatively contacts with an outer end of the extended element of the spring member for operating the flat spring member to lift up the movable iron core, and said inner annular element being resiliently bent by the extended element to push the movable iron core away from the valve seat, the outer annular element of the spring member operating as a fulcrum for the extended element when the outer end of the extended element is moved by the operative member.

4,344,604

VARIABLE RAKE STAIR RAIL ASSEMBLY

Gene Basey, Rowland Heights, Calif., assignor to Zenith Stairways & Building Products, Inc., Walnut, Calif.

Filed Oct. 27, 1980, Ser. No. 201,259
Int. Cl.³ E04H 17/14
U.S. Cl. 256—65 29 Claims

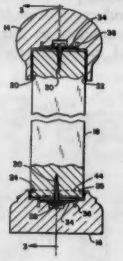
1. A variable rake stair rail assembly which comprises:

a wooden hand rail having an elongated recess;

a wooden shoe rail having an elongated recess;

a plurality of elongated balusters extending in spaced relation intermediate the shoe rail and the hand rail;

means for joining each of said balusters to said hand rail and said shoe rail, said means for joining comprising an elongated member extending into at least one end of each baluster and having a generally enlarged axial extremity disposed in spaced relationship thereto and a flat elongated strip shaped member secured to each of said rails at the bottom of each said recess; said strip shaped member having an opening therein for receiving and accepting said enlarged axial extremity of said elongated member, without removing said elongated member from the end of the baluster, said opening allowing movement of said enlarged axial extremity in and out thereof in at least one relative position of said opening and said enlarged axial extremity; and



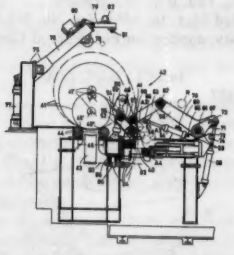
means for locking the ends of said balusters in the desired assembled position relative to said hand and shoe rails.

4,344,605

APPARATUS FOR CUTTING THE END OFF A COILED STRIP

Horst Ganseuer, Kreuztal-Eichen; Dieter Remus, Netphen, and Heinz Gail, Hilchenbach, all of Fed. Rep. of Germany, assignors to Siemag Transplan GmbH, Netphen, Fed. Rep. of Germany

Filed Jul. 27, 1981, Ser. No. 287,044
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1980, 3028538; European Pat. Off., Jun. 5, 1981, 81 104360
Int. Cl.³ B23K 7/10
U.S. Cl. 266—48 12 Claims



1. An apparatus for cutting the end off a strip wound as a coil having a diameter lying between a predetermined maximum diameter and a predetermined minimum diameter, said apparatus comprising

a fixed support;

a substantially horizontal support cradle for said coil on said support;

means on said support defining a vertically open gap spaced from said cradle for cutting said strip along a horizontal cutting plane as said strip passes down through said gap;

a guide on said support above and to one side of said gap between same and said cradle;

an inner pivot arm pivoted on said support about a horizontal inner axis and having an outer end;

an outer pivot arm pivoted on said outer end of said inner arm about a horizontal outer axis and having an outer end carrying a pusher; and

means connected between said arms and said support for displacing said pusher horizontally and vertically above said plane relative to said guide for urging said pusher against said strip at said guide at any of several vertically offset locations therealong.

4,344,606

WELDING AND CUTTING HANDPIECE

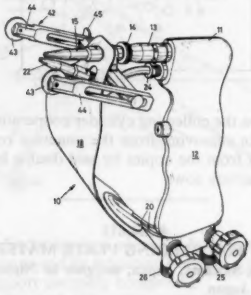
Nicholas T. E. Dillon, 10 East St., Magill, South Australia, Australia

Filed Dec. 29, 1980, Ser. No. 220,263

Claims priority, application Australia, Aug. 29, 1980, 61908/80

Int. Cl.³ B23K *7/10*

U.S. Cl. 266—66 **9 Claims**



1. A welding and cutting handpiece which is useful as an oxy-acetylene torch, having a flame nozzle which is in gas flow communication with a gas mixing chamber,

a cutting nozzle having an oxygen directing aperture extending therethrough and being in gas flow communication with an oxygen conduit in the handpiece,

and means securing the cutting nozzle to be so inclined to the flame nozzle as to direct an oxygen stream from one side of a flame into the flame of combustible gas when a flame issues from the flame nozzle.

4,344,607

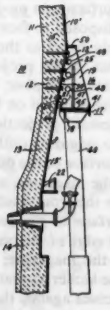
BLAST FURNACE SUPPORT APPARATUS

Marvin O. Smith, Jr., Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Dec. 1, 1980, Ser. No. 211,616

Int. Cl.³ C21B *7/00*

U.S. Cl. 266—198 **4 Claims**



1. In a vertically disposed furnace having a stack section, a bosh section and a hearth section joined together and supported on a plurality of columns spaced around the furnace, a truncated cone-shaped jacket enclosing a stack section and extending downward from the top, the improvement comprising:

(a) a bosh jacket enclosing the bosh section,

(b) an annular jacket extending the bosh jacket upward to intersect the truncated cone-shaped jacket,

(c) a mantle ring surrounding the furnace adjacent the bosh jacket and spaced therefrom, and mounted on the tops of the plurality of columns below the intersection of the truncated cone-shaped jacket and the annular jacket, and

(d) a plurality of radially spaced, vertically disposed gusset plates connected to the annular jacket and the mantle ring.

4,344,608

TILT DRIVE COUPLING FOR STEEL MAKING CONVERTER

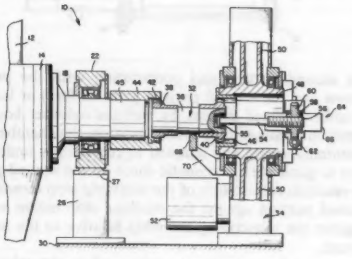
Erwin Mayr, Augsburg, Fed. Rep. of Germany, assignor to Zahnraderfabrik Renk A.G., Augsburg, Fed. Rep. of Germany

Filed Nov. 5, 1981, Ser. No. 318,318

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1980, 3043850

Int. Cl.³ C21C *5/50*

U.S. Cl. 266—245 **11 Claims**



1. A drive coupling for selectively interconnecting a crucible vessel and a tilt drive of a converter, the crucible vessel having a pair of trunnions and means journalling the trunnions about a horizontal axis for tilting the crucible to various operative positions, the tilt drive including means for providing a rotative output, the crucible including means for engaging the drive coupling, the coupling including a shaft, the shaft having means for driving the coupling engaging means, the shaft having means for engaging the rotative output means whereby the tilt drive is operable to rotate the crucible about the trunnion journalling means to selected positions, the coupling further including means for selectively disengaging and engaging the coupling engaging means of the crucible, the selective disengaging and engaging means including means for axially moving the shaft away from and toward the crucible coupling engaging means whereby the coupling is disengaged by moving the shaft away from the crucible to permit removal of the crucible and engaged with a crucible to be installed by moving the shaft toward the crucible.

4,344,609

RESILIENT POSITIONING APPARATUS

Harold U. Bond, Vancouver, Canada, assignor to Kockums Industries Limited, Surrey, Canada

Filed Apr. 21, 1980, Ser. No. 142,612

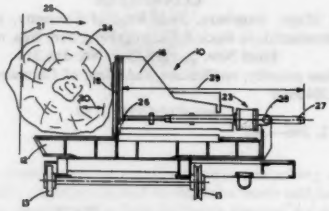
Int. Cl.³ B23Q *3/08*

U.S. Cl. 269—27 **8 Claims**

1. A resilient positioning apparatus for a machine adapted to resiliently absorb force from an object moving thereagainst by moving momentarily relative to a machine datum, the machine having a machine stop means fixed relative to the machine datum, the apparaus including:

(a) a telescoping assembly having extendable and retractable first and second portions which cooperate with power and control means of the machine to position the two portions accurately relative to each other, the first portion cooperating with the object to locate the object, the second portion having an assembly stop means adapted to contact the machine stop means for registration of the second portion,

(b) a gas cylinder assembly having a partition means and a gas cylinder body, the partition means being secured to the second portion of the telescoping assembly so as to move therewith, and being in sealing engagement with the gas cylinder body, the gas cylinder body having first and second ends with sealing means adjacent at least the first end thereof, the gas cylinder body enclosing a length of



the second portion and cooperating with the partition means and the second portion so as to form at least one chamber defined in part by the gas cylinder body, the partition means and the second portion; the chamber being essentially sealed and adapted to receive gas under pressure to generate a pneumatic force on the second portion to establish registration of the assembly stop means of the second portion against the machine stop means so as to register the telescoping assembly relative to the machine datum,

the pneumatic force being overcome when the telescoping assembly is subjected to an excessive force which moves the second portion out of registration to absorb the excessie force, and thereafter the pneumatic force re-establishes registration of the second portion to reposition the telescoping assembly.

4,344,610

FOLDING APPARATUS FOR REEL OR WEB-FED ROTARY PRINTING MACHINES

Willi Jeschke, Heidelberg, and Hans Müller, Leimen, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

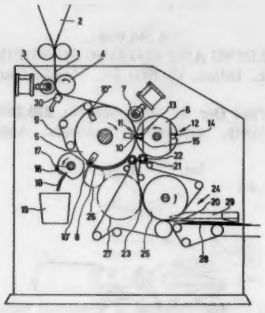
Filed Jul. 6, 1980, Ser. No. 175,638

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1979, 2931968

Int. Cl.³ B41F *13/58*

U.S. Cl. 270—6 **8 Claims**

1. Folding machine in web-fed rotary printing machines for longitudinally folding a paper web, for cross-cutting the thus longitudinally folded paper web and for collecting separated copies on a collecting cylinder cooperating with a knife cylinder, the cylinders having respectively parallel axes disposed in a common plane and being disposed substantially tangentially to one another, the collecting cylinder having an odd number of puncture rows on the periphery thereof for securing the paper web to the collecting cylinder and the knife cylinder having an even number of cutting rows spaced about the periphery thereof for securing the paper web to the collecting cylinder and the knife cylinder having an even number of cutting rows spaced about the periphery thereof for cutting the paper web into page-length segments, the cylinders being rotatable in opposite rotary directions, the improvement therein comprising means defining the puncture rows firmly built into the collecting cylinder, said cutting rows formed alternatingly of a single knife for making a single cut in said web at one end of a page-length segment and a double knife for making two substantially simultaneous cuts in said web at an opposite end of said page-length segment, said single knife being disposed at a location whereat it leads the respective



puncture row on the collecting cylinder cooperating therewith and a device for removing from the puncture rows trimmed strips separated from the copies by said double knife on both sides of the puncture rows.

4,344,611

DEVICE FOR FEEDING PLATE MATERIALS

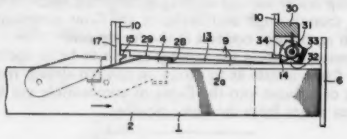
Shigeru Morita, Saitama, Japan, assignor to Nippon Flute Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1980, Ser. No. 200,402

Claims priority, application Japan, Jun. 26, 1980, 55/86797

Int. Cl.³ B65H *1/08*

U.S. Cl. 271—129 **4 Claims**



1. A device for feeding plate materials comprising: a magazine containing a number of stacked plate materials and guiding them toward its outlet, the plate materials being urged in the direction perpendicular to their surfaces; a reciprocating member disposed at the outlet of the magazine in such a manner that it can be moved back and forth to receive the plate members from the outlet of the magazine and carry them one by one on its support surface to a predetermined position, the support surface being disposed to face the outlet of the magazine; a kicker retractably fitted to the reciprocating member through a spring so that, when projected from the support surface of the reciprocating member, the kicer engages with the rear edge of the plate material on the support surface as it advances; a rear engagement projection protruding inwardly from the rear wall of the magazine outlet so that it opposes and engages the outer rear surface of the outermost one of the plate materials contained in the magazine; a front engagement projection protruding from the front wall of the magazine outlet toward the support surface of the reciprocating member so that it opposes the front edge of the outermost one of the plate materials contained in the magazine; and a claw projecting from the front end of the kicker so that it catches the rear edge of the plate material pressed against the support surface of the reciprocating member, said kicker being disposed so that the upper surface of the kicker, as it moves forward, comes into sliding frictional engagement with the underside of the plate material whose rear end is engaging with the rear engagement

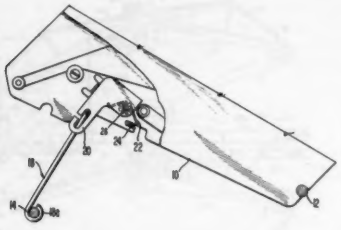
projection of the magazine and moves the last-recited plate material off of said rear engagement projection of the magazine and into position to be fed out of the magazine and thereafter to be caught and moved by said claw of said kicker.

4,344,612

SHEET FEEDER SUPPORT ASSEMBLY

Walter F. Leise, Farmingville, and John J. Darcy, Nesconset, both of N.Y., assignors to Burroughs Corporation, Detroit, Mich.

Filed May 12, 1980, Ser. No. 149,177
Int. Cl.³ B65H *1/00*
U.S. Cl. 271—162 **8 Claims**



1. A sheet feeder support assembly for use between a sheet feeding apparatus and its mounting frame to a printing mechanism, said support assembly comprising:

a rigid support rod mounted on said mounting frame;

a locking latch member slidably connected to said support rod and pivotably connected to said sheet feeding apparatus to support said sheet feeding apparatus in a raised position; and

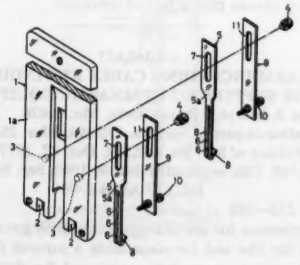
a torsion spring mounted between said locking latch member and said sheet feeding apparatus, one end of said spring connected to said locking latch member, the other end of said spring connected to said sheet feeding apparatus such that a lifting motion on said sheet feeding apparatus enables said spring to pivot said locking latch member and, in turn, causes said support rod to supportably engage the sheet feeding apparatus in said raised position.

4,344,613

DEVICE FOR SUCCESSIVELY STRIPPING SHEET FROM A STACK OF SHEETS

Kingo Isikawa, 33-4, Doichi-cho 2-chome, Mizuho-ku, Nagoya-shi, Aichi-ken, Japan

Filed Apr. 11, 1980, Ser. No. 139,578
Claims priority, application Japan, Apr. 18, 1979, 54-47480
Int. Cl.³ B65H *1/06*
U.S. Cl. 271—165 **8 Claims**



1. In a suction-type feeder for feeding sheets one by one from a stack of sheets having a feeding end, including a sheet immediately removable from said feeding end, and at least an other sheet in contact with the immediately removable sheet, the improvement comprising:

a backplate adapted to be in contact with a lateral side of said stack,

a plurality of flexible sheet-stripping members, each including a base portion secured to said backplate, and a serrated operative portion extending from said base portion, adapted to extend in a direction at least partly over said feeding end of said stack, and being curved inwardly, and

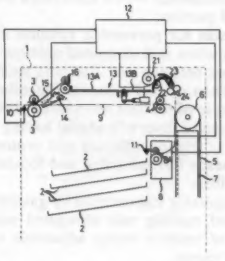
resilient means for urging said stripping members in said direction, the sheets, upon operatively making contact with said serrated operative portions, being induced to vibrate, whereby said other sheet is separated from the immediately removable sheet.

4,344,614

COLLATOR

Tamaki Kaneko, Fujisawa, and Tugio Okuzawa, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Feb. 29, 1980, Ser. No. 125,976
Claims priority, application Japan, Mar. 7, 1979, 54-27870
Int. Cl.³ B65H *39/11, 7/06*
U.S. Cl. 271—288 **5 Claims**



1. An improved collator suitable for collating sheets received from a copying apparatus, printing apparatus or the like of the type having, in combination,

a plurality of bins arranged side by side in spaced parallel relation;

conveying means for conveying the sheets through a sheet conveying path to the plurality of bins;

direction changing means for changing the direction of movement of the sheets conveyed by the conveyor means for selectively delivering the sheets to the plurality of bins;

sheet jam detecting means for detecting a sheet jam occurring in the sheet conveying path; a jam tray disposed adjacent to the sheet conveying path for temporarily storing thereon the sheets following the occurrence of a sheet jam; a deflecting plate for deflecting sheets from the sheet conveying path to the jam tray; and control means operable responsive to said jam detecting means for moving the deflecting plate to a position for directing the sheets from the sheet conveying path to the jam tray; wherein the improvement comprises;

the jam tray including a fixed portion and a sheet pressing portion movably mounted adjacent said fixed portion;

sheet feeding means for feeding one sheet after another from a stack of sheets on said sheet pressing portion of the jam tray to the sheet conveying path; and

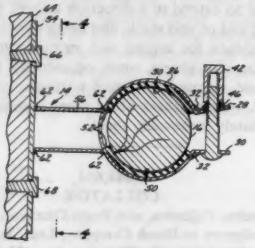
said sheet feeding means including sheet feed roller means for engaging a sheet on said sheet pressing portion and directing the sheet therefrom to the sheet conveying path, and means, operably connected to the control means, for moving said sheet pressing portion to engage a sheet on said sheet pressing portion with said sheet feed roller means responsive to said control means.

4,344,615

CONTROLLED FRICTION EXERCISING DEVICE

Charles H. Carlson, 52nd 11th St., Manhattan Beach, Calif. 90266

Filed Apr. 10, 1980, Ser. No. 138,887
Int. Cl.³ A63B *23/00*
U.S. Cl. 272—67 **14 Claims**



1. An exercise device comprising:
an elongated rotatable member having a central portion with a generally circular cross-section and a gripping portion located on either side of said central portion;
a clamping mechanism which encircles a substantial part of said central portion;
mounting means for preventing rotation of said clamping mechanism when said elongated member is rotated;
a liner disposed between said clamping mechanism and said central portion of said elongated member, said liner including a layer of resilient material adjacent said clamping mechanism and a layer of material having a relatively low coefficient of friction adjacent said central position; and
adjustment means for tightening and loosening said clamping mechanism;
whereby an operator can exercise by grasping said gripping portions and rotating said elongated member with the resistance of rotation being adjustable by way of said adjustment means.

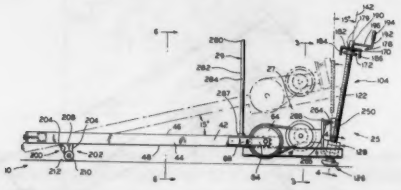
4,344,616

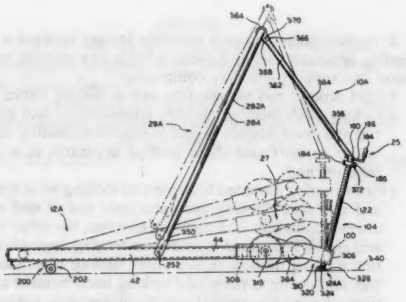
EXERCISE TREADMILL

Ralph Ogden, 1304 Fisher St., Munster, Ind. 46321

Filed Aug. 5, 1980, Ser. No. 175,516
Int. Cl.³ A63B *23/06*
U.S. Cl. 272—69 **7 Claims**

1. An exercise treadmill comprising:
a generally planar slider bed having a head end, a tail end, and a fabric top surfacing extending substantially between said ends thereof,
an endless belt trained over said slider bed defining an upper belt run overlying said slider bed top surface and a lower run passing under said slider bed,
means for driving said belt for movement of said belt upper run from said head end to said tail end of said slider bed,
said slider bed having secured to same adjacent said head end thereof a cross member extending transversely thereof,
a pair of screw members threadedly mounted in said cross member in spaced apart relation and for rotation about upright axes that are in parallelism and that are inclined at like acute angles off perpendicular relationship relative to the plane of said slider bed,
said axes each lying in a plane extending normally and longitudinally of said slider bed and being angled relative to the plane of said slider bed to extend forwardly of said slider bed upwardly of said slider bed plane,
each of said screw members having a foot journalled thereof,
said slider bed having spaced feet adjacent its tail end,
said screw members each having threaded portions of substantially equal lengths,
and means for simultaneously rotating said screw members in the same direction in forward and reverse directions for threading said cross member longitudinally of said screw member threaded portions to raise and lower said slider bed head end,
said feet being proportioned to support said slider bed with said plane thereof horizontally disposed when said screw members are in their retracted positions relative to said cross member with the screw member threaded portions thereof being largely disposed above said cross member,
said screw member threaded portions being proportioned in length such that when said screw member threaded portions are in their extended positions relative to said cross member, with said screw member threaded portions





thereof being largely disposed below said cross member, said screw members shift relative to the vertical to be disposed substantially vertically and in firm supporting relation to the slider bed with the slider bed disposed at the same said acute angle value with respect to the horizontal so as to be in the maximum grade effect position,
said screw members in their said retracted positions being at said acute angle relative to the off perpendicular relationship to the plane of said slider bed and said screw members in their said extended positions being substantially vertically disposed,
said belt being formed from nylon and said top surfacing being canvas that is free of lubricant.

4,344,617

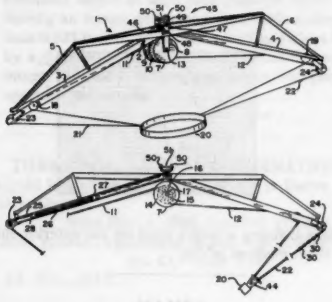
CROSSARM INCLUDING CABLE REWINDING MEANS FOR SUPPORTED GYMNASTIC EQUIPMENT

Raymond J. Murphy, Bonne Terre, Mo. 63628

Continuation-in-part of Ser. No. 135,194, Mar. 28, 1980, which is a division of Ser. No. 842,532, Oct. 17, 1977, Pat. No. 4,204,719. This application Jun. 9, 1980, Ser. No. 157,503
Int. Cl.³ A63B *7/00*
U.S. Cl. 272—109 **2 Claims**

1. A crossarm for use in conjunction with gymnastic equipment or the like and for suspending a support for holding a gymnast, said crossarm being arranged for depending from upwardly disposed structure, said crossarm including a length of structural member extending above and laterally to either

side of any supported gymnast, said crossarm structural member comprising a tubular member, a pair of cables, one of each cable operatively associated with each laterally extending tubular member of the crossarm and being connected thereto, each cable extending downwardly for sheaving upon the gymnast's support, a pair of sheaves operatively associated with the proximate ends of the tubular member of the crossarm, each cable further extending around each pair of sheaves operatively associated with each end of the tubular support, each of the cables extending upwardly from the support and being arranged around each of said sheaves and further extending into and partially through the said tubular member, the ends of said cables extending into the tubular member being resiliently



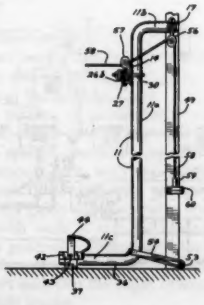
fixed with respect to said tubular member, cable holding means, said cable holding means being secured proximately centrally of the tubular member of the crossarm, said cable holding means being divided for winding and holding each cable separately, said cable holding means comprising a sectionalized reel, one of each cables being wound upon separate reel sections, spiral spring means being located within the cable holding means, said spring at one end being fixed to the cable holding means and its sectionalized reel, said spring at its other end being fixed with respect to the structural member of the crossarm, and said spring means causing a bias tending to effect a retracting of the cables forcefully unwound by the weight of the gymnast and the suspended support during crossarm usage.

4,344,618

EXERCISE APPARATUS

William H. Dudley, 1531 Sheridan Ave. North, Minneapolis, Minn. 55411

Filed Jan. 21, 1980, Ser. No. 114,100
Int. Cl.³ A63B *21/06*
U.S. Cl. 272—117 **16 Claims**



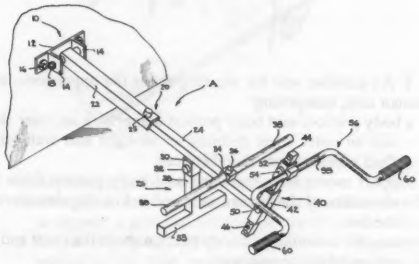
1. Exercise apparatus comprising a main support member having an upper end portion, a vertically elongated intermediate portion having an upper end joined to the upper end portion and a lower end, and a lower end portion joined to the intermediate portion lower end to extend horizontally away therefrom in a given direction, a first and a second foot support, means for mounting the foot supports to and on opposite sides of the lower end portion in relation to said given direction, a first and a second hand grip, means for mounting the hand grips on the intermediate portion on opposite sides thereof in relation to said given direction, the last mentioned means being at a substantially higher elevation than the foot supports, and cross bar means adapted for mountingly engaging the opposite sides of a door frame, said cross bar means being connected to the upper end portion to extend outwardly thereof on opposite sides thereof in relation to said given direction.

4,344,619

PIVOTED WEIGHT LIFTING APPARATUS

William Szabo, 10126 Langmoir Ave., Sunland, Calif. 91040

Continuation-in-part of Ser. No. 79,095, Sep. 26, 1979, Pat. No. 4,323,236. This application Feb. 11, 1980, Ser. No. 120,154
Int. Cl.³ A63B *21/06*
U.S. Cl. 272—117 **15 Claims**



1. A body exercising apparatus comprising:

(a) a lever arm in the form of a single pole-like member having first and second opposite ends,

(b) a mounting means on the first end of said lever arm for pivotal mounting to a relatively stationary structure so that said pole-like member is the only element connected to and extending outwardly from said mounting means,

(c) bar bell weight retaining means on said lever arm for removably retaining bar-bell type weight discs so that weight discs mounted on said weight retaining means are carried by and moveable with said lever arm, said weight retaining means and the weight discs carried thereby being located between the mounting means and the second end of said lever arm,

(d) adjustable positioning means secured to the second end of said lever arm and being located outwardly thereof, said adjustable positioning means comprising a tubular member and a pole vertically shiftable in said tubular member, at least one of said pole or tubular members having pairs of vertically spaced apart holes and the other having at least one pair of holes which are alignable with any of the pairs of spaced apart holes so that a pin element may be inserted in the aligned holes to lock said pole in a selected position with respect to said tubular member, and

(e) handle means secured to said pole of said adjustable positioning means at the second end of said lever arm for engagement by the hands of a user of said body exercising apparatus, so that a user may attempt to lift the lever arm pivotally with respect to the mounting means against the weight placed on said weight retaining means, said adjustable positioning means being manually adjustable so that the height of said handle means is adjustably positionable relative to said lever arm.

4,344,620

EXERCISE VEST

Andre J. Debski, 4256 English Oak Dr., Doraville, Ga. 30340

Filed Nov. 9, 1979, Ser. No. 92,835
Int. Cl.³ A63B *21/12, 21/18*
U.S. Cl. 272—119 **3 Claims**

1. An exercise vest for wearing about the upper torso by a human user, comprising:

a body portion, said body portion comprising an inner sheet and an outer sheet defining an air-tight and water-tight fluid compartment therebetween;

support means for supporting said body portion from the shoulders of the human user and below the shoulders of the user;

means for fastening said body portion about the chest and rib region of the human user;

a fluid inlet formed in said body portion and communicating with said fluid compartment; and

partitioning means for partitioning said fluid compartment into a plurality of interconnected fluid channels, said partitioning means comprising a plurality of parallel line welds each joining together said inner and outer sheets of said body portion, and a passage defined in each of said line welds and communicating between adjacent ones of said fluid channels.

4,344,621

TARGET WITH ENERGY-ABSORBING FOAM MAT

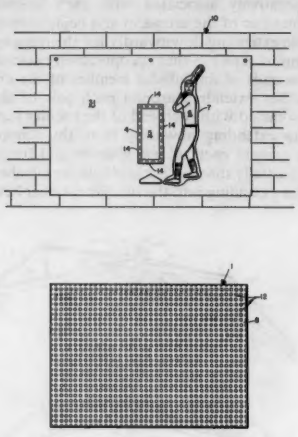
David E. Baker, Zionsville, Ind., assignor to E-A-R Corporation, Indianapolis, Ind.

Filed Mar. 3, 1980, Ser. No. 126,341
Int. Cl.³ A63B *69/40*
U.S. Cl. 273—26 A **12 Claims**

2. A practice device for a sporting activity wherein a sport projectile is hurled or struck toward a specified target zone, said device comprising:

(a) an energy absorbing polymeric foam mat element, said mat element being indentable by and fully but slowly recoverable from the impact of a sport projectile thereagainst, said mat element being comprised of an array of apertures through the thickness thereof, said apertures each being of a diameter of at least about ¼ inch (0.635 cm), said apertures being spaced apart so as to define a continuous web of polymeric foam, the total surface area of said apertures being, in the aggregate, between about 40 and about 50 percent of the overall surface area of said mat element;

(b) a continuous and compliant polymeric sheet element having a smooth exterior surface disposed over and bonded continuously to at least one face of said mat element of (a);



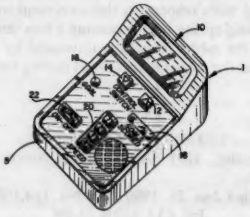
(c) indicia defining a target zone on the exterior surface of said sheet element of (b).

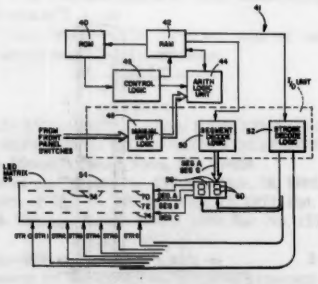
4,344,622

DISPLAY APPARATUS FOR ELECTRONIC GAMES

Joseph Nissim, Huntington Beach, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 916,036, Jun. 16, 1978, abandoned, which is a continuation of Ser. No. 781,807, Mar. 28, 1977, abandoned. This application Sep. 18, 1979, Ser. No. 76,556
Int. Cl.³ A63F *9/00, 9/14*; G06F *3/14*
U.S. Cl. 273—85 G **9 Claims**





1. In a battery powered, hand-held game device having a case, a display supported by said case for emulating the appearance of distinguishable objects in motion along one or more

paths defined by a plurality of spaced path positions, and a programmed controller supported by said case for establishing and controlling operations of said display, said programmed controller being programmed according to game rules whereby a first emulated object is attempted to be moved on said display without reaching a prescribed position relative to a second emulated object, the improved display which comprises:

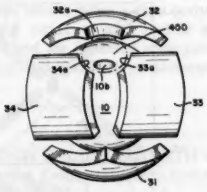
a plurality of selectively energizable chips commonly arranged adjacent each other on a high dielectric supporting material, a single one of said chips disposed at each of said plurality of path positions at spacings for effectively providing perceptible images as said first and second emulated objects, each chip energizable to provide only one emulated object at such path position, each of said chips having an image producing area with a dimension of at least 0.037 inches, adjacent ones of said chips being spaced by a dimension of at least 0.150 inches for providing said image, whereby magnifying lenses for producing said spacings are avoided.

4,344,623

THREE-DIMENSIONAL COMBINATION TOY

Toshiyuki Isobe, Tokyo, Japan, assignor to Daiwa Corporation, Tokyo, Japan

Filed Dec. 4, 1980, Ser. No. 213,030
Claims priority, application Japan, Sep. 1, 1980, 55-120758
Int. Cl.³ A63F *9/08*
U.S. Cl. 273—153 S **2 Claims**



1. A three-dimensional combination toy comprising:

a central part having a generally spherical outer surface;

six similarly shaped guide canopies each having four sides and having the general shape of a square portion of a spherical surface of substantially uniform thickness, installed above the outer surface of said spherical central part and spaced therefrom by means of an integrally formed support pole, such that guide spaces are defined between said guide canopies and said central part outer surface, said guide canopies being spaced apart from one another with each of said six guide canopies having its four sides generally aligned with the corresponding four sides of a face of a cube circumscribed about said spherical central part such that the edges of adjacent guide canopies define guide tracks;

seven movable blocks, each of which is provided with a slide piece and each having the general shape of a circular portion of a spherical surface of substantially uniform thickness and dimensioned to slide within and be retained by said guide spaces and which is attached to its respective block via an inwardly projecting slide leg free to move within said guide tracks; and

a fixed block fastened to said central part;

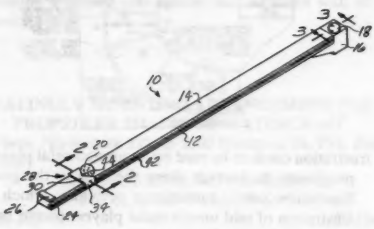
wherein the eight corner spaces formed where any three of said guide canopies are adjacent to one another act as rest positions, and wherein said fixed block is fastened at a predetermined one of said rest positions and each of said slide legs is free to move from a chosen one of the remaining rest positions to a second chosen one of said remaining rest positions via said guide tracks.

4,344,624

PRACTICE PUTTING TRAINER

Paul D. Laursen, 1620 Buckingham, Lincoln Park, Mich. 48146

Filed Jan. 14, 1981, Ser. No. 225,128
Int. Cl.³ A63B *69/36*
U.S. Cl. 273—176 F **9 Claims**



1. A practice putting trainer comprising:

an elongated, narrow, planar base having sufficient stiffness to support a golf ball without perceptible deflection;

a flat ball engaging putting surface formed along an upper portion of the base, said putting surface having a width substantially equal to the diameter of a golf ball;

a cup for receiving the golf ball disposed at one end of the base; and

a ball rest including a means for retaining the golf ball on the putting surface until struck by a putter; and

wherein a golf ball rolling along the length of the base from the ball rest to the cup will roll off of the sides of the putting surface if hit improperly.

4,344,625

GAME ENCOURAGING SELF-IMPROVEMENT

Rosalie Frudakis, 2316 Locust St., Philadelphia, Pa. 19103

Filed May 22, 1980, Ser. No. 152,203
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—242 **5 Claims**

1. A game for encouraging adherence to a self-improvement program, comprising:

(a) a board having depicted thereon a path to a goal of said program;

(b) a plurality of playing pieces for at least one player, said playing pieces representing stages of development in the self-improvement program, and said playing pieces adapted to mark the current position of said at least one player progressing along the path;

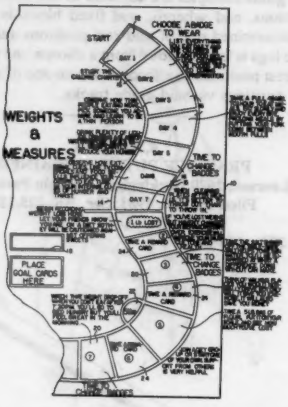
(c) means for allocating rewards for said at least one player for progress toward said goal; and,

(d) means for securing moral support for said at least one player from competing players, from non-players and from internal resources of said at least one player, said means comprising:

legends at spaced intervals along said path directing said at least one player's attention to benefits of adherence to the program;

badges to be worn by said at least one player, said badges soliciting moral support;

caution cards to be read by said at least one player when tempted to give up the program, said caution cards suggesting continued adherence to the program; and,



frustration cards to be read by an unsuccessful player who progresses backwards along the path to the goal, said frustration cards authorizing activities which direct frustration of said unsuccessful player toward harmless objects and away from said program.

4,344,626

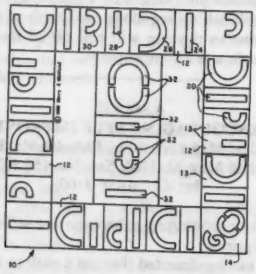
BOARD GAME FOR FORMING ALPHABETIC SYMBOLS

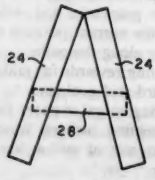
Mary J. Wadland, 635 Maple Ave., Downers Grove, Ill. 60515

Filed Aug. 11, 1980, Ser. No. 176,817

Int. Cl.[3] A63F *3/00*; G09B *1/40*

U.S. Cl. 273—243 **5 Claims**





1. An educational board game apparatus for a plurality of young child players to teach them how alphabetic symbols are formed, comprising:

a gameboard having a main course of sequential board positions for player markers;

respective distinctive player markers for each player;

chance means for determining player marker movement along said main course;

a plurality of differing symbol component pieces corresponding in shape to fractionalized prescribed alphabetic symbols, symbol component pieces of the same shape being marked with differing colors;

said main course positions having indicia thereon identifying respective component pieces;

a reference item having indicia thereon depicting said prescribed alphabetic symbols and the manner in which said symbol component pieces may be combined into alphabetic symbols; and

a color chart having groups of indicia thereon conforming in size and shape to said symbol component pieces, each group having a unique color substantially matching one of said differing colors of said symbol component pieces, and each group forming a symbol, whereby a player can place symbol component pieces conforming in size, shape and color upon said color chart to duplicate substantially the symbol of each color chart group, thereby to associate a color with a symbol.

4,344,627

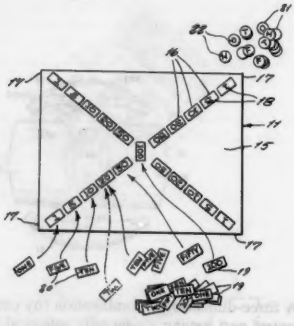
ALPHABET GAME

Jessie L. Jones, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Oct. 20, 1980, Ser. No. 198,776

Int. Cl.[3] A63F *3/06*

U.S. Cl. 273—273 **1 Claim**



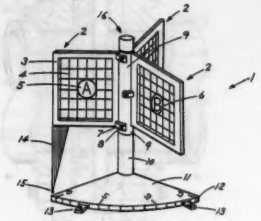
1. An alphabet game comprising in combination, a rectangular gameboard a deck of cards and a set of chips, said gameboard having rows of rectangular spaces marked with numerals, said cards each being printed alphabetically with a word indicating one said numeral, and each said chip being printed with a letter which is a first letter of one said word printed on said cards, wherein there are plurality of chips corresponding to each said word, wherein said rows on said gameboard extend diagonally between opposite corners of said gameboard and wherein said numerals are in ascending order of one to fifty, in combination with a central space with numeral **100** at the intersection of said rows defining one winner of said game, while any section of either said row between any said corner and said central space defines a second winner if said spaces are covered by appropriate said cards.

4,344,628

TURNSTILE GOAL AND GAMES USAGE

Norwood R. Warehime, 704 W. 34th St., Baltimore, Md. 21211

Filed Oct. 30, 1980, Ser. No. 202,188
Int. Cl.³ A63B *63/06*
U.S. Cl. 273—388 **5 Claims**



1. Improved turnstile goal and games usage wherein said goal comprises two to five identical readily mountable paddle type elements, a rotatable vertical paddle support sleeve means, a fixed vertical spindle and support column means, a turnstile base support means, a turnstile friction control means, and a turnstile fractional rotation indicating means, with said paddle type elements being attached in vertical positions at equal angular spacing around the peripheral surface of said paddle support sleeve means, said paddle support sleeve means being carried on said spindle and support column means, said spindle and support column means being attached to said base support means and holding assembled said goal in a secure and upright position, said goal being capable of rotation in a responsive direction when either side of any of its said paddle type elements is struck by a game ball or disc propelled by team players, said goal being characterised in that the said paddle type elements of said goal have substantially greater height and width measurements than those of the diameter measurements of the various balls and disc used, said height and width measurements of the said paddle type elements of said goal ranging from 9 to 36 inches (22.9 to 91.4 cms), each side of said paddle type elements of said goal having a specific type of distinguishing marking or designation indicating which side of said paddle type elements of said goal is to be struck by player propelled ball or disc for team play advantage, and said paddle support sleeve means being a pipe body with an elongated sleeve bushing inside of said paddle support sleeve means, with a screw and lug fastening arrangement employed for readily mounting said paddle type elements to said pipe body.

4,344,629

SELF-LAPPING HIGH SPEED SEAL WITH WEAR-IN LIP

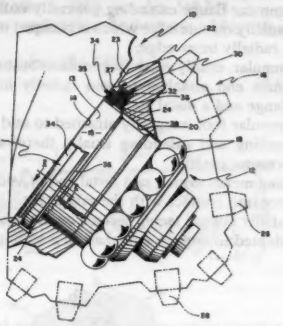
Erwin S. Oelke, Cypress, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Oct. 14, 1980, Ser. No. 196,990
Int. Cl.³ F16J *15/34;* F16C *33/78;* E21B *10/08*
U.S. Cl. 277—1 **10 Claims**

1. A seal apparatus for a rock bit, said seal being positioned in a cavity formed between a leg of said rock bit, said leg having a journal extending therefrom, and a rotatable cone mounted on said journal, said seal comprising:

a metal ring, said ring having a diameter that will fit within said cavity, a peripheral surface formed by said ring subsequently serving as part of a metal-to-metal seal,

a resilient material partially encapsulating said metal ring, said resilient material forming an O-ring type of seal in said cavity formed between said leg of said rock bit and said rotatable cone, during initial rotation of said cone on said journal, a portion of said resilient material nearest said metal peripheral surface eventually wears away exposing said peripheral metal surface to an adjacent cavity wall, said metal surface and said cavity wall subsequently forming a lapped sealing surface, said resilient sealing material prevents loss of a lubricant stored within said rock bit during the time said peripheral surface of said metal ring is



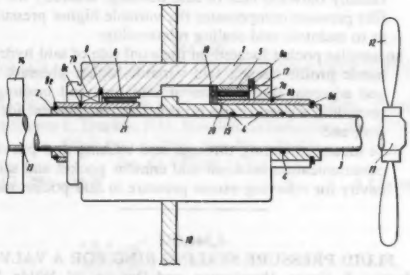
forming a lapped seal against said adjacent wall of said cavity.

4,344,630

SEALINGLY MOUNTING ARRANGEMENT FOR PROPELLER SHAFTS OF WATERCRAFT

Imre Veres, Nienredder 21b, D-2000 Hamburg 54, Fed. Rep. of Germany

Filed Dec. 3, 1979, Ser. No. 99,854
Int. Cl.³ F16J *15/34, 15/54*
U.S. Cl. 277—4 **26 Claims**



1. An arrangement for sealingly mounting a rotary member, particularly a propeller shaft, in a passage of a support, particularly of a watercraft hull, comprising dynamic sealing means; bearing means; and separating means interposed between and fluid-tightly separating said sealing means and said bearing means; wherein said separating means includes a separating sleeve surrounding the rotary member for relative movement; wherein said sealing means is interposed between said separating sleeve and the rotary member; and further comprising a support sleeve mounted in the passage; and wherein said separating sleeve is received in said support sleeve for rotation relative thereto.

4,344,631

PRESSURE INSENSITIVE LIP SEAL

Leo W. Winn, Schenectady, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Nov. 18, 1980, Ser. No. 207,907
Int. Cl.³ F16J *15/32, 15/40*
U.S. Cl. 277—29 **3 Claims**

1. A lip seal for dynamically sealing a low pressure cavity

against entrance of a variable higher pressure fluid between said seal and a rotating shaft, comprising:

a housing within which said shaft rotates;

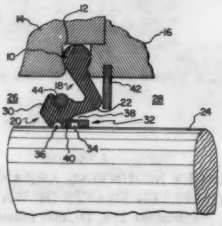
an annular flange extending generally radially and having a radially outside edge which is clamped to said housing and a radially inner edge;

an annular, axially extending resilient bushing having a proximate end attached to said radially inner edge of said flange and a distal end;

an annular foot integrally attached to said distal end of said bushing and extending axially therefrom into said low pressure cavity;

biasing means urging said distal end of said bushing and said foot into contact with the said shaft;

a radially inward facing surface on the bushing and said foot adapted to engage said shaft in a sealing relationship;



a hydrodynamic profile formed in said inwardly facing surface and arranged to generate a pressurized fluid film between said surface and said shaft, which pressure is a function of the variable higher pressure exerted on the radially outward face of said bushing, whereby the fluid film pressure compensates the variable higher pressure so as to maintain said sealing relationship;

an annular pocket located on the axial side of said hydrodynamic profile nearest said variable higher pressure fluid and adjacent the junction of said foot and bushing for providing a pressurized oil containment plenum for said seal; and

duct means extending through said bushing and providing communication between said annular pocket and said oil cavity for relieving excess pressure in said pocket means.

4,344,632

FLUID PRESSURE SEALING RING FOR A VALVE

Norman F. Green, Warrington, and Douglas W. Wilda, West Chester, both of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 124,305, Feb. 25, 1980, abandoned. This application Aug. 18, 1981, Ser. No. 293,787

Int. Cl.³ F16K *25/00*

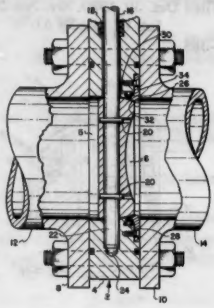
U.S. Cl. 277—152 **10 Claims**

1. A fluid pressure seal comprising

a first member having an annular recess of a polygonal cross-section therein with an exit slit,

a sealing means disposed in said annular recess and having an outer side positioned in contact with an internal corner of said recess, an inner side extending out of said recess through said exit slit, and a concave face between said outer side and said inner side with said concave face being spaced from a respective side of said recess, and

a second member having a fluid sealing peripheral edge in contact with said inner side of said sealing means when said second member is in a position to seal against a fluid exerting said fluid pressure, said fluid pressure acting on said sealing means to urge said concave face against said wall and said outer side into said corner to further extend said inner side of said sealing means out of said exit slit to increase the contact pressure of said inner side against said peripheral edge of said second member, said sealing means including a pair of bowed seal rings arranged with respective convex faces diverging from an area of contact at said



inner side of said seal rings and respective concave faces spaced from respective walls of said recess.

4,344,633

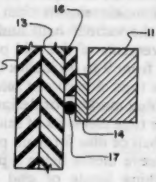
GASKET FOR ELECTROLYTIC CELL

Andrew J. Niksa, Concord, Ohio, assignor to Diamond Shamrock Corporation, Dallas, Tex.

Filed May 22, 1981, Ser. No. 266,447

Int. Cl.³ F16J *15/10*; C25B *9/00*

U.S. Cl. 277—228 **11 Claims**



1. A multi-layer gasket structure for an electrode comprising an outboard layer of a material having a combination of a Type A Shore Scale Durometer Hardness (ASTM Specification No. D-2240-7) ranging from about 40 to about 70 and a Compression Set (ASTM Specification D-395-69-Method A) of zero plus to about 40 percent and an inboard barrier layer of a material which is corrosion-resistant, noncontaminating and stable upon contact with chlor-alkali cell anolyte.

4,344,634

COMPRESSION RINGS

Teruo Onozaki, Tokyo, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Dec. 4, 1980, Ser. No. 212,967

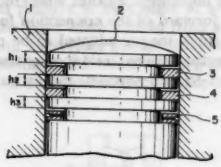
Claims priority, application Japan, Dec. 4, 1979, 54-157294

Int. Cl.³ H01F *1/04*

U.S. Cl. 277—236 **2 Claims**

1. A compression ring for internal combustion engines having excellent heat collapse resistance and excellent wear resistance on upper and lower sides, said ring being composed of stainless steel comprising from 0.6 to 0.7% by weight C, from

0.15 to 0.40% by weight Si, from 0.6 to 0.8% by weight Mn, from 12.0 to 14.0% by weight Cr, and the balance of Fe and



impurities, wherein a running face of the ring which slides against the cylinder wall has a surface treated layer.

4,344,635

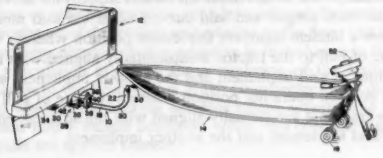
SHORT HAUL TOW BAR

Roy E. Welton, 3180 Browns Valley Rd., Napa, Calif. 94558

Filed Nov. 10, 1980, Ser. No. 205,672

Int. Cl.³ B60P *3/10*

U.S. Cl. 280—414.1 **5 Claims**



1. A short haul tow bar for a motor vehicle on which is mounted a square hitch receiver comprising a rectangular tubular receptacle having aligned holes in the sides thereof and a retainer pin receivable in said aligned holes, for moving over a short distance a boat supported at one end by a pair of wheels, said tow bar comprising:

a tubular tow bar adapted at one end to be received in and to extend generally horizontally from, said square hitch receiver;

restraining means on said one end to receive a retainer pin extended through said aligned holes and prevent withdrawal of said one end from said hitch receiver;

vertical stop portions on said one end engageable with the top and bottom of said hitch receiver to restrict closely vertical oscillation of said bar;

lateral stop portions on said one end engageable with the sides of said hitch receiver to restrict closely horizontal oscillation of said bar;

said tow bar being bent intermediate its ends so that the other end thereof is generally upright; and

a generally horizontal hook device carried on said other end and adapted to engage an eye on the other end of said boat.

4,344,636

TANK FOR TRANSPORTING LIQUIDS

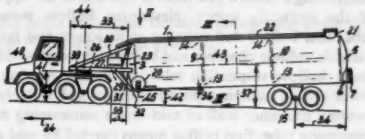
Cornelis van der Lely, Brüschenrain 7, Zug, Switzerland

Filed May 9, 1980, Ser. No. 148,551

Claims priority, application Netherlands, May 10, 1979, 7903657

Int. Cl.³ B60P *3/22*

U.S. Cl. 280—5 C **14 Claims**



1. An elongated mobile tank for transporting liquid material including at least one set of supporting wheels intermediate the length of the tank and a front draw member for towing and supporting the forward end of the tank, said forward end being inclined downwardly from said wheels in the normal direction of travel and having a forward end wall, said draw member including a draw pin adapted for connection to a towing vehicle, said forward end being located, at least in part, at a lower level than said draw pin and immediately to the rear thereof, said tank comprising internal partition means with at least one restrictive opening that defines an uninterrupted space for liquids.

4,344,637

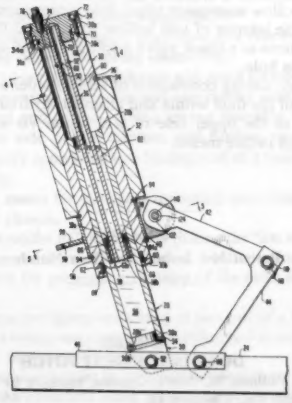
HYDRAULIC/PNEUMATIC SUSPENSION SYSTEM FOR SNOWMOBILES

Leo M. Williams, Jr., 801 Beeber St., Williamsport, Pa. 17701, and Steven L. Dunkle, P.O. Box 405, Salladasburg, Pa. 17740

Filed Jan. 2, 1980, Ser. No. 109,028

Int. Cl.³ B62B *13/00*

U.S. Cl. 280—21 R **5 Claims**



1. A snowmobile suspension system for suspending a snowmobile chassis on an underlying ground contact member, said suspension system comprising:

a pair of telescoping hollow suspension tubes defining a variable volume chamber therebetween, said suspension tubes being closed at their non-telescoping ends,

means for mounting the closed end of one of said telescoping tubes to said chassis, and for mounting the closed end of said other telescoping tube to said underlying ground contact member,

a damping system carried by said telescoping tubes and fixedly borne by one of said tubes, said damping system comprising a hollow rod fixed at one end to the upper end of the vertically upper telescoping hollow suspension tube, said hollow rod opening at its lower end into said variable volume chamber and being positioned within said lower hollow suspension tube and fixedly bearing at its lower end, a damping piston sealably and slidably confronting the inner wall of said lower telescoping hollow suspension tube, first orifice means carried by said damping piston and opening to opposite faces of said piston and to opposite sides of said variable volume chamber,

a hydraulic fluid positioned within said variable volume chamber and filling said chamber to a position along said hollow rod, on opposite sides of said piston,

means for gas pressuring the balance of said variable volume chamber above the level of said hydraulic fluid such that said damping piston forms a stationary floating hydraulic seal between said upper and lower sections of said variable volume chamber on opposite sides of said piston,

and wherein said damping system further comprises second orifice means carried by said hollow rod near its upper end, said second orifice means comprising means for permitting fluid flow from the interior of said hollow rod into said variable volume chamber upper section during compression of said telescoping hollow suspension tubes but preventing fluid from entering the interior of said hollow rod through said second orifice means from said variable volume chamber upper section;

and wherein said second orifice means comprises at least one small diameter hole drilled transversely within said hollow rod and said fluid flow permitting means further comprises a peripheral groove within the outer periphery of said hollow rod at the level of said second orifice means hole, and an elastomeric O-ring disposed within said peripheral groove, overlying said second orifice means hole such that during retraction of said telescoping hollow suspension tubes, fluid may flow from the interior of said hollow rod into the upper chamber section about the elastomeric O-ring, but during extension of said telescoping hollow suspension tubes, fluid is prevented from entering the interior of said hollow rod by said O-ring which functions as a check valve member for said second orifice means hole;

whereby, during contraction of said cylinder and compression of the fluid within said chamber, hydraulic fluid may pass to the upper side of said piston via said first and second orifice means.

4,344,638

Patent Not Issued For This Number

4,344,639

DUAL IMPLEMENT HITCH

Lorne R. Pollard, St. Ann's, Canada, assignor to International Harvester Co., Chicago, Ill.

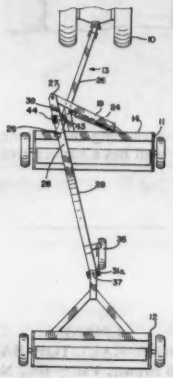
Filed May 29, 1980, Ser. No. 154,206

Int. Cl.³ B60D *1/00*

U.S. Cl. 280—411 C **6 Claims**

1. In combination, an implement and a hitch adapted to be drawn by a tractor, comprising:

an implement, a support mounted on the front of said implement, a hitch, said hitch including a curved beam pivotally mounted on said support and constructed to extend over and rearwardly of said implement, said curved beam being adapted to be pivotally connected adjacent its rearward end to another implement, a caster wheel mounted on said curved beam forward of the connection for the another implement, a hitch tongue adapted to be pivotally connected to a tractor drawbar, said tongue also being pivotally connected to said support, means connecting said



tongue and curved beam for relative motion therebetween, said means being located rearwardly of the pivotal mounting of said curved beam on said support, and hydraulic power means mounted on said support for moving said hitch tongue and said curved beam via said means from a tandem transport implement position wherein the line of pull to the tractor is substantially aligned with the center of said implement and the another implement and an echelon operating position wherein the line of pull of the tractor is substantially aligned with the adjacent ends of said implement and the another implement.

4,344,640

APPARATUS FOR THE PREVENTION OF JACKKNIFING OF ARTICULATED VEHICLES

Istvan Ratsko; Jozsef Ivony; Jeno Madi, and György Karasz, all of Budapest, Hungary, assignors to Autoipari Kutato Intezet and Ikarus Karosszeria es Jarmügyar, both of Budapest, Hungary

Filed Aug. 21, 1980, Ser. No. 180,092

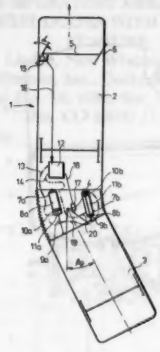
Claims priority, application Hungary, Aug. 21, 1979, AU 428

Int. Cl.³ B62D *53/06*

U.S. Cl. 280—432 **7 Claims**

1. In an anti-jackknifing apparatus for an articulated vehicle having articulation locking means connectable to the pivotally connected vehicle units, means for sensing the steered angle of the front wheels of the front unit and means for evaluating the

deviation from the angle of articulation predetermined by the steered angle of the front wheel at the angle of articulation, the improvement wherein the articulation locking means includes locking actuator means and wherein the evaluating means includes first means for applying a control signal to the locking actuator means corresponding to the deviation sign which is determined as positive at that angle of articulation which is disposed to the right when viewed from above the vehicle in the direction of movement thereof from the angle of articulation corresponding to the wheel steering angle and as negative at that angle of articulation which is disposed to the left from



the angle of articulation corresponding to wheel steering angle and second means for applying another input signal to the locking actuator means representing the direction sign which is predetermined as positive at that change in the angle of articulation at which when the vehicle is viewed from above the articulation of the trailing unit relative to the front unit is in the clockwise direction and as negative at that change in the angle of articulation at which the articulation of the trailing unit relative to the front unit is in the counterclockwise direction, and wherein the locking actuator means actuates the locking means into a locked condition when two opposite sign input signals are applied thereto.

4,344,641

SNOW SKI HAVING AIR CUSHION FORMING UNDERSURFACE

Bertold Lehn, Schenebüelweg 1, CH 8240 Thayngen, Switzerland

Continuation-in-part of Ser. No. 138,916, Apr. 10, 1980, abandoned. This application Jun. 9, 1980, Ser. No. 157,485

Claims priority, application Switzerland, Apr. 4, 1979, 3513/79; Fed. Rep. of Germany, Jul. 17, 1979, 2928106

Int. Cl.³ A63C *5/00*

U.S. Cl. 280—601 **2 Claims**

1. In a ski having upper and side surfaces and a bottom running surface, the improvement comprising

(a) at least one chamber formed in the running surface and open downward, said chamber having means at the side surfaces of the ski to substantially prevent lateral escape of air from said chamber when the ski is situated upon a smooth surface,

(b) at least one air entrance opening formed in a surface other than the running surface, said opening being open toward the travelling direction for the ski, and

(c) a channel communicating said opening to said chamber, said channel comprising a Venturi tube having a converging portion directed toward said opening and a diverging portion open to said chamber.

4,344,642

VEHICLE AXLE MOUNTING ARRANGEMENT

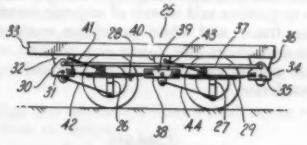
John Goth, 58 Lough St., Guildford, New South Wales, Australia 2161, assignor to John Goth and James Goth, both of New South Wales, Australia, a part interest

Filed Aug. 4, 1980, Ser. No. 175,036

Claims priority, application Australia, Aug. 24, 1979, P30180

Int. Cl.³ B60G *11/02*

U.S. Cl. 280—682 **10 Claims**



1. A mounting arrangement for axles of a vehicle having a multi-axle system, the vehicle having a chassis, which comprises

two leaf spring assemblies connected in series, an axle supporting each spring assembly,

a first rocker non-rigidly connected to a forward end of a leading one of the spring assemblies,

a second rocker non-rigidly connected to a rearward end of a trailing one of the spring assemblies,

a further rocker having a fulcrum and being located intermediate the spring assemblies and non-rigidly connected to a rearward end of the leading spring assembly and at an opposite side of the fulcrum said further rocker being non-rigidly connected to a leading end of a trailing spring assembly,

mounting means for pivotably mounting each rocker to said vehicle chassis,

a motion transfer link mechanism linking the first and second rockers; and torque rods and at least one torque shaft operative for preventing twisting of the axles about their axes,

each torque rod being connected at one end of a respective axle and being connected at the other end to means functionally integral with said chassis,

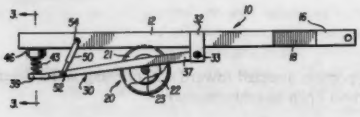
said at least one torque shaft being connected at one end to one of the axles and being connected at the other end to means functionally integral with said chassis so as to constitute a parallel link mechanism with the respective torque rod; whereby up-down movement of one spring assembly causes rectilinear movement of the other spring assembly in an opposite direction.

4,344,643

WHEEL SUSPENSION ASSEMBLY FOR A TRAILER

Earl B. Ray, 103 Glendale Ave., Huntington, W. Va. 25705

Filed Sep. 22, 1980, Ser. No. 188,990
Int. Cl.³ B60G *11/16*
U.S. Cl. 280—724 **4 Claims**



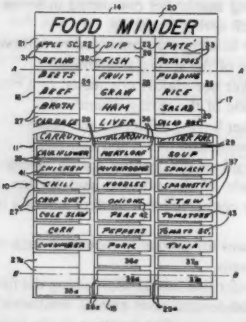
1. A wheel suspension assembly for a trailer having a base frame of longitudinal side members, front and rear end braces, a central cross brace and towing means attached to said front end brace, said wheel suspension assembly comprising: a pair of depending support plates, the upper end portion of each to be attached to said longitudinal side members of said trailer frame, the lower depending end portions being interconnected by a fixed pivot pin; a substantially rectilinear support frame having its forward end pivotally mounted on said pivot and extending rearwardly under said trailer frame to a position beneath the rear end brace thereof to support load cushioning means which will interact with said rear end brace of said trailer frame; and at least one two-wheel-axle assembly secured to said support frame at a position which is one-third the length of said support frame from said forward end of said frame and below said support frame to transfer carried weight to said axle of said axle assembly extending beyond said longitudinal side members to position said wheels of said axle assembly outside said trailer frame; said wheel suspension assembly being attached to said trailer base frame at a position wherein said wheel-axle assembly is under the longitudinal center of said trailer base frame.

4,344,644

DOMESTIC INVENTORY SYSTEM

Paul S. Somogyi, 60 Delwood Rd., Cherry Hill, N.J. 08002

Filed Jun. 13, 1980, Ser. No. 159,210
Int. Cl.³ G09F *3/00*; B42D *15/00*
U.S. Cl. 283—19 **7 Claims**



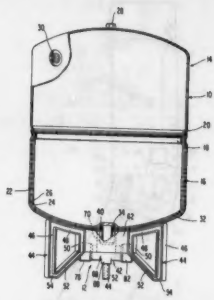
1. A domestic inventory system comprising a board-like display member for mounting on a wall, a vertically aligned series of indicia on said member representing a variety of items of household use, said series of indicia being of a color having a characteristic appearance, and a plurality of markers each corresponding to a respective one of said indicia and removably and replaceably secured to said member in covering relation with the corresponding indicia, said markers being of a color having a second characteristic appearance different from the first mentioned characteristic appearance, and said markers being removably securable to refrigerator food containers for designating the contents thereof upon removal from said member, to thereby present to view said indicia having said first mentioned characteristic appearance as exposed upon marker removal to indicate the current inventory of items of household use.

4,344,645

TEE-TYPE LEG BRACKET

Kenneth L. Kirk, Cranston, R.I., assignor to Amtrol Inc., West Warwick, R.I.

Filed Oct. 6, 1980, Ser. No. 194,280
Int. Cl.³ F16L *3/00*
U.S. Cl. 285—61 **19 Claims**



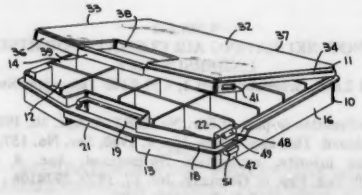
1. Tee-type leg bracket for supporting a tank, which has a hemispherical-type of bottom surface and a short nipple mounted on the bottom surface at substantially a right angle thereto, comprising (i) a central frame, (ii) a short pipe vertically mounted on the central frame, the vertically-mounted short pipe being adapted to mate with the short nipple mounted on the bottom of the tank, and (iii) at least three support legs detachably attached to the central frame, the bottom surface of the tank resting on the top portion of the support legs.

4,344,646

DETACHABLE LATCH

John M. Michel, Coatesville, Pa., assignor to Woodstream Corporation, Lititz, Pa.

Filed May 27, 1980, Ser. No. 153,562
Int. Cl.³ E05C *19/06*
U.S. Cl. 292—87 **10 Claims**



1. A closure for a container, comprising:

a container body having a peripheral wall with an external surface and with a latch pocket defined as a recess in said external surface;

a cover member for said container having a slot defined therein, said slot being positioned to overlie said latch pocket when said container member is closed by said cover member; and

an integral detachable flexible latch member attached to said container body in said latch pocket with a snap-fit, said

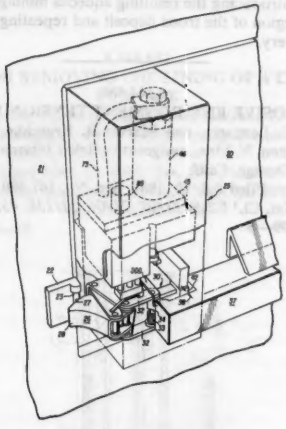
latch member having a bolt member projecting in a first direction from a first surface of said latch member to extend through said cover slot without contacting said cover member when the latch member is attached into said latch pocket and is unflexed and when said container member is closed by said cover, said latch member further including actuating means on said first surface for receiving a force directed to flex said latch member in a direction opposite to said first direction to withdraw said bolt member from said slot.

4,344,647

EXTERIOR OPERATING ARRANGEMENT FOR EMERGENCY EXIT DOORS WITH DELAYED OPENING FEATURE

Roy E. Van Der Linden, New Windsor, Md., assignor to Reliable Security Systems, Inc., Cockeysville, Md.

Filed Jun. 16, 1980, Ser. No. 160,025
Int. Cl.³ E05C *15/02*
U.S. Cl. 292—201 **8 Claims**



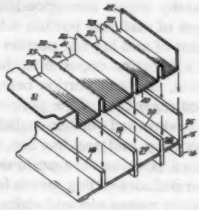
1. In combination:
a latch bolt for securing an emergency exit door when the bolt is projected;
a toggle linkage connected to the latch bolt for holding the latch bolt in the projected position when in a dogging mode and for allowing the latch bolt to move to the retracted position when in an undogging mode, wherein the undogging mode is over center from the dogging mode;
a sliding link in engagement with the toggle linkage for shifting the toggle linkage from the dogged mode to the undogged mode upon sliding from a first position to a second position;
a bell crank having one arm connected to the slider for sliding the slider from the first position to the second position upon rotating the other arm of the bell crank;
an interposer positioned adjacent to the other arm of the bell crank and means for mounting the interposer to shift in and out of alignment with the bell crank;
a lock, including: a rotatable tumbler and means on said tumbler for engaging said interposer to move said interposer into alignment with said second arm of said bell crank for unlatching the door from the outside and for moving said interposer out of alignment with said second arm of said bell crank for preventing unlatching of the door from the outside;
means accessible on the outside of the door and in engagement with the interposer to move the interposer against the second arm of the bell crank and to thereby cause the slider to move the toggle from the dogged to the undogged mode, and
said latch bolt being connected to a delay means for retarding retracting of the latch bolt and further including means for deactivating delay means whereby the latch bolt retracts without delay upon operating the outside operating means.

4,344,648

DUST PAN FOR SLIDING GLASS DOOR

Calvin R. Mapp, 1351 NW. 12th St., Miami, Fla. 33125

Filed Apr. 3, 1981, Ser. No. 250,880
Int. Cl.³ A47L *13/52*
U.S. Cl. 294—55 **4 Claims**



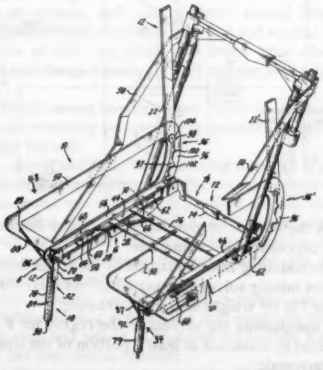
1. A dust pan for door thresholds having a plurality of upstanding tracks to guide sliding door panels and screens comprising, in combination,
an elongate flat handle,
a plurality of U-shaped reversely folded track covers,
a plurality of U-shaped scoop portions joining said track covers,
a flash flange and adjacent U-shaped flash scoop remotely spaced from the handle,
said track covers, flash, and scoops terminating at both ends of the dust pan in end faces essentially parallel to each other and perpendicular to the long axis of the handle.

4,344,649

FOLDING BABY CARRIERS

Henry Fleischer, 18 Notch Park Rd., Little Falls, N.J. 07424

Filed Sep. 10, 1979, Ser. No. 73,745
Int. Cl.³ A47C *4/00, 1/02*
U.S. Cl. 297—30 **27 Claims**



1. A carrier for infants capable of being adjustably deployed in a plurality of positions, with or without a frame, comprising, in combination, a head-back portion, a substantially horizontally disposed seat portion pivotally connected to the head-

back portion, and said head-back portion being adapted to be moved between upright and reclining positions relative to said seat portion, said seat portion being applied to slide forward in a direction away from said head-back portion or rearward in a direction toward said head-back portion, in a substantially horizontal attitude, upon movement of said head-back portion, a leg rest portion pivotally connected to said seat portion and responsive to movement of said seat portion and head-back portion and adapted to be moved between reclining and upright positions relative to and upon corresponding movement of said seat portion, and locking means for temporarily locking the position of said head-back portion in a first fixed position at a desired angle to said substantially horizontally disposed seat portion, whereby upon release of said locking means, said head-back portion may be pivoted to a second fixed position with respect to said substantially horizontally disposed seat portion and thereby impart corresponding substantially horizontal movement of said seat portion which in turn imparts pivotal movement of said leg rest portion with respect to said seat portion in a direction opposite to the movement of said head-back portion, said seat portion being substantially horizontally disposed regardless of the position of said head-back and leg rest portions, and further including carrier support means for supporting said seat portion when in a forward position, rearward position or a position therebetween, and said seat portion includes sliding means for slidably engaging said carrier support means and said sliding means of said seat portion comprises at least one slidably engageable member for slidably engaging a corresponding member of said carrier support means, and said carrier support means comprises a seat support frame.

4,344,650

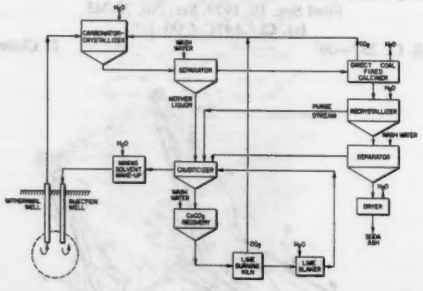
RECOVERY OF ALKALI VALUES FROM TRONA DEPOSITS

Michael L. Pinsky, Mount Holly, and John Walden, Hightstown, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 114,020, Jan. 21, 1980, abandoned. This application Dec. 15, 1980, Ser. No. 216,096

Int. Cl.³ E21B *43/28*

U.S. Cl. 299—4 **16 Claims**



1. A method for recovering alkali values from underground trona deposits which comprises

(i) introducing into the region of the trona deposit an aqueous mining solvent having dissolved therein from about 2 to 7% by weight sodium hydroxide;

(ii) maintaining the solvent in the region for a period sufficient to solubilize at least a portion of the trona as sodium carbonate;

(iii) withdrawing from the region at least a portion of the resulting mining solution;

(iv) carbonating at least a portion of the withdrawn mining solution to convert the major portion of the sodium carbonate contained therein into sodium sesquicarbonate and/or sodium bicarbonate;

(v) crystallizing the sodium sesquicarbonate and/or sodium bicarbonate;

(vi) separating the crystallized solids from the mining solution mother liquor;

(vii) calcining the crystallized solids in a direct coal fired calciner to form anhydrous sodium carbonate contaminated with impurities;

(viii) recrystallizing the contaminated anhydrous sodium carbonate in water to form sodium carbonate-containing crystals while the contaminants remain in the aqueous liquor;

(ix) separating purified sodium carbonate-containing crystals from the aqueous liquor containing contaminants;

(x) maintaining an aqueous purge of liquor containing said contaminants;

(xi) adding sodium hydroxide and water to at least one of said liquors, the amounts of sodium hydroxide and water being adjusted so as to form an aqueous mining solvent containing from about 2 to 7% by weight sodium hydroxide; and

(xii) reintroducing the resulting aqueous mining solvent into the region of the trona deposit and repeating the cycle of recovery.

4,344,651

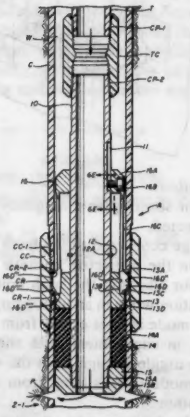
CORROSIVE ENVIRONMENT TENSION PACKER

Kenneth E. Longacre, and Marvin R. Kruschke, Sr., both of Farmington, N. Mex., assignors to Baker International Corporation, Orange, Calif.

Filed Jul. 10, 1980, Ser. No. 167,300

Int. Cl.³ E21B *23/03, 23/06, 33/138, 43/28*

U.S. Cl. 299—5 **5 Claims**



1. A method of injecting a corrosive liquid into the bore of an injection well during mineral leaching operations, said well being encased by a first conduit having first and second conduit members, said conduit members being interengaged by a coupling element whereby a locking recess is defined within said coupling element and between said conduit members, comprising the steps of:

(1) introducing into said well a packer assembly carried on a second conduit, said packer assembly comprising: a body member communicating to said second conduit; an inwardly flexible, outwardly urged collet assembly exterior of said body; a slotted configuration on said body; control means on said collet assembly and carryable within said slotted configuration; means on said body defining a pocket for selective receipt of said collet assembly relative

to said locking recess; and elastomeric packer body means below said pocket means and carried by said body member, contourably urged into sealing relation which said first conduit subsequent to locking engagement of said collet assembly and said second conduit;

(2) locating said collet assembly effectively below said locking recess;

(3) simultaneously rotating and picking up said second conduit to enable said collet assembly to effectively be received within said locking recess;

(4) continuing manipulation of said second conduit subsequent to step (3), above, whereby said pocket is effectively immediate said collet assembly, whereby the locked relationship between said locking recess, said collet assembly and said pocket prevents relative longitudinal movement between said packer assembly and said first conduit; and

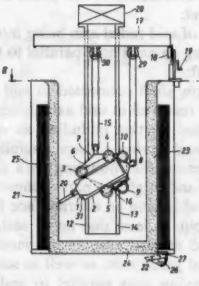
(5) continuing manipulation of said second conduit as in step (3), above, whereby said elastomeric packer body means is urged into sealing engagement with said first conduit.

4,344,652

MEANS FOR REMOVING THE LINING OF A CRUCIBLE FURNACE

Ake Archenholtz, Västeros; Yngve Caisander, and Gustav Haas, both of Helsingborg, all of Sweden, assignors to ASEA Aktiebolag, Västeros, Sweden

Filed Mar. 20, 1980, Ser. No. 132,184
Claims priority, application Sweden, Mar. 23, 1979, 7902619
Int. Cl.³ E21C *3/00*
U.S. Cl. 299—70 **12 Claims**



1. An apparatus for removing the lining of a crucible furnace, said crucible furnace having a central axis, the lining-removing apparatus comprising

a tubular support element extendable substantially along the central axis of said crucible furnace, said tubular support element having an upper end located outside of said crucible furnace and an open lower end locatable within said crucible furnace, said tubular support element including guide means extending longitudinally thereof,

vacuum-generating means attached to said tubular support element to create a vacuum therein for removing debris from the crucible furnace upwardly therethrough,

a hammer drill mounted on the guide means of said tubular support element, said hammer drill including a tool for contacting and breaking up the lining of the crucible furnace, and

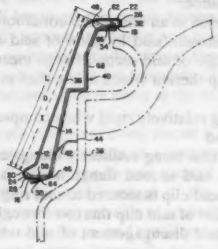
drive means connected to said hammer drill for moving said hammer drill along the guide means of said tubular support, said drive means being operable from outside of said crucible furnace.

4,344,653

WHEEL TRIM DEVICE

Leonard W. Sheldon, Rochester, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jun. 6, 1980, Ser. No. 157,021
Int. Cl.³ B60B *7/00*; B21D *53/26*
U.S. Cl. 301—37 T **12 Claims**



1. An ornamental wheel device for a wheel comprising:

a ring portion being preformed of resilient sheet metal to include an annular wall and inwardly turned first and second flange means respectively at first and second radial extremities of said ring portion to define open channels between said flange means and said annular wall adjacent thereto;

each said flange means having a base joined to said annular wall at said extremity and extending inwardly to terminate at an edge thereof;

said flange means and said channels being disposed of a first side of said annular wall to be adjacent said wheel when said ornamental wheel device is installed on said wheel;

a plurality of clips circumferentially spaced around said first side of said annular wall with each of said clips having an extending toothed member thereon adapted for biting engagement of said wheel;

each said clip having a first end which is making engaging contact with said ring portion at said first extremity thereof and a second end which is frucated to include a space between the fork means thereof; and

said second flange means being received within said space to cause said ring portion to be resiliently elongated and under tension to secure said clip to said ring portion and insure its retention thereon throughout engagement and disengagement of said wheel.

7. An ornamental wheel device for a wheel comprising:

a ring portion being preformed of resilient sheet metal to include an annular wall and inwardly turned first and second flange means respectively at first and second radial extremities of said ring portion to define open channels between said flange means and said annular wall adjacent thereof;

each said flange means having a base joined to said annular wall at said extremity and extending inwardly to terminate at an edge thereof;

said flange means and said channels being disposed at a first side of said annular wall to be adjacent said wheel when said ornamental wheel device is installed on said wheel;

a plurality of clips circumferentially spaced around said first side of said annular wall with each of said clips having an extending toothed member thereon adapted for biting engagement of said wheel;

each said clip having a first end which is making engaging contact with said ring portion at a first extremity thereof and a second end which is frucated to include a space between the fork means thereof;

said second flange means being received within said space to secure said clip to said ring portion for retention thereon throughout engagement and disengagement of said wheel;

said ring portion having a predetermined distance between

the location of said engaging contact with said first end of said clip and said edge of said second flange means when said clip is secured thereto;

said clip having a predetermined length from said location of said engaging contact with said ring portion to an extended end of said fork means located within said channel of said second flange means;

said predetermined length being greater than said predetermined distance;

said ring portion in an unstressed condition having an initial distance between said location of said engaging contact and said edge of said second flange means prior to securing said clip therein which is less than said predetermined distance;

said clip being relatively rigid when compared with said ring portion; and

said ring portion being resiliently elongated and under tension when said second flange means is received within space and said clip is secured to said ring portion to insure said retention of said clip thereon throughout said engagement and said disengagement of said wheel.

4,344,654

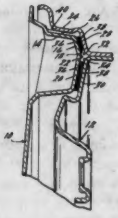
WHEEL TRIM RETENTION

Frederick A. Apezynski, 15602 Parklane, Livonia, Mich. 48154

Continuation of Ser. No. 7,019, Jan. 29, 1979, abandoned, which is a continuation of Ser. No. 792,253, Apr. 29, 1977, abandoned. This application Mar. 6, 1981, Ser. No. 241,257

Int. Cl.³ B60B *7/00*

U.S. Cl. 301—37 R **19 Claims**



15. A wheel trim comprising:

a trim member having means defining a generally axially inwardly facing surface portion and a center portion adapted to overlie and conceal fastener receiving openings provided in said vehicle wheel when said wheel trim is assembled thereto;

a first hook and loop fastener member comprising a base portion having a plurality of outwardly projecting loops per square inch provided thereon; and

a second hook and loop fastener member comprising a base portion having a plurality of outwardly projecting hooks per square inch provided thereon;

one of said first and second members being secured to said axially inwardly facing surface portion and another of said first and second members being disposed thereon with said hooks and said loops being in mutually cooperative releasable retaining engagement;

a radially outwardly extending protrusion provided on said trim member adapted to engage an axially extending portion of a vehicle wheel when said wheel trim is installed thereon so as to assist in positioning said wheel trim with respect to said vehicle wheel;

said another of said first and second members having an adhesive material provided thereon whereby said another of said first and second members may be permanently secured to a vehicle wheel upon initial installation of said wheel trim to said vehicle wheel, said first and second members being thereafter separable so as to enable said wheel trim to be repeatedly removed and reinstalled on said vehicle wheel utilizing the same first and second hook and loop fastener members.

4,344,655

TWO-PART MOULDED WHEEL MADE OF PLASTIC MATERIAL FOR CHILDREN'S VEHICLE

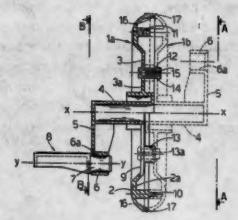
Giuseppe Pellegrino, Via Luca Giordano, 142-Napoli (I), Italy

Filed Jul. 10, 1980, Ser. No. 168,182

Claims priority, application Italy, Jan. 11, 1979, 47588 A/79

Int. Cl.³ B60B *37/00*

U.S. Cl. 301—2.5 **4 Claims**



1. A wheel made of plastic material for a children's vehicle with a pedal-driven wheel consisting of two half-wheels corresponding to the two halves of a shell-like wheel separated by the plane of symmetry perpendicular to the axis thereof, each half-wheel comprising:

a hollow, peripheral semi-toroidal portion connected to a central disc portion;

a first hollow shaft extending outwardly from said central disc portion;

a radial arm integral with said first hollow shaft which serves as a crankshaft of the pedal crank of said pedal-driven wheel;

the outer end of said radial arm being integral in turn with a sleeve having an axial hole parallel to the axis of said first hollow shaft;

a second hollow shaft connected to said pedal crank which is rotatably received in said axial hole;

said central disc portion including an opening facing said radial arm and having a shape complimentary thereto in order to permit the moulding in a single step of each semi-wheel and of all the parts connected thereto; and

each half-wheel having an internal face from which at least one guide pin, at least one guide seat, at least one male member and at least one female member are provided, each pin and guide seat, as well as said male and female members having axes parallel to and diametrically opposed with respect to said half-wheel axis.

4,344,656

AIR SUSPENSION SYSTEM FOR PIGGYBACK TRANSPORTATION OF GOODS

Robert C. Masterson, Jr., Sugar Grove, Ill.; R. Gordon Thomas, Portsmouth, and John G. Johnson, Virginia Beach, both of Va., assignors to Air Rail, Inc., Sugar Grove, Ill.

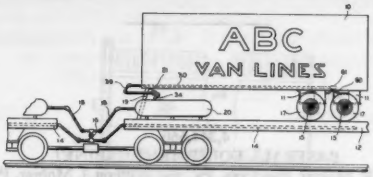
Filed Feb. 4, 1980, Ser. No. 118,642

Int. Cl.³ B60T *13/74*

U.S. Cl. 303—2 **20 Claims**

1. In a multi-car railroad train having an air brake system for supplying air during rail transport from a railroad car having a train air brake line to a conventional air suspension semi-trailer truck loaded on said railroad car, the semi-trailer truck having a conventional tractor and air suspension trailer, said trailer having an air suspension system normally connected to and supplied by air from an air-compressor on said tractor, whereby there is no air supply for the trailer air suspension system when the tractor is disconnected from the trailer during rail transport of the trailer, the combination of said train air

brake system and said trailer air suspension system, said combination comprising air brake means for said railroad car, said brake means being connected to said train air brake line passing between railroad cars and extending to an engine of said train; an air supply line means connected between said trailer air suspension system and said train air brake line; and an air flow



regulator means disposed in said air supply line means for preventing air from flowing from said train air brake line to said trailer air suspension system when the air pressure in said train air brake line drops below a predetermined level and for preventing air from flowing from said trailer suspension system to said train air brake line.

4,344,657

AXIAL/ROTARY GUIDE ELEMENT

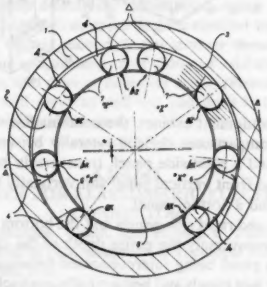
Denis Borel, Matzingen, Switzerland, assignor to SRO Kugellagerwerke J. Schmid-Roost AG, Switzerland

Filed Dec. 27, 1979, Ser. No. 107,544

Claims priority, application Switzerland, Dec. 31, 1978, 13265/78

Int. Cl.³ F16C *29/06*

U.S. Cl. 308—6 C **29 Claims**



1. A guide element for ball bearings for permitting linear and rotational movement of a sleeve around a shaft, the guide element comprising:

an external sleeve having a continuous cylindrical bore in its interior;

an internal tubular casing within the sleeve bore that can rotate freely in the sleeve and that is retained axially relative to the sleeve; the casing extending around the shaft;

at least three seatings for receiving ball bearings being defined in the casing, whereby the casing defines a ball race; ball bearings being provided in all of the seatings; the seatings and the ball bearings being sized and shaped for permitting the balls to effect contact between the shaft and the bore of the sleeve;

each seating comprising a closed ball bearing travel circuit, comprising a first and a second neighboring, longitudinally extending rectilinear portion, and the first and second rectilinear portions of the seating being joined to one another by joining portions joining the longitudinal ends of the rectilinear portions, whereby the ball bearings in a seating may move around the entire circuit;

all of the circuits being one of either of a first and a second circuit, and there is at least one first circuit and at least one second circuit; all of the ball bearings of each of the first circuits being of same size relatively larger diameter, and all of the ball bearings of each of the second circuits being of same size relatively smaller diameter;

the casing being eccentric with respect to the sleeve to enable contact between the ball bearings and both of the shaft and the sleeve for both the larger and the smaller diameter ball bearings; the casing having a first side circumferentially around the casing and having an opposite second side circumferentially around the casing; each of the first circuits being at the first side of the casing and each of the second circuits being at the second side of the casing;

the first rectilinear portion of every circuit is located circumferentially around the casing at a location nearer to the second side of the casing having each of the second circuits, whereby the ball bearings in the first rectilinear portion of every circuit are able to contact both the sleeve and the shaft, while the second rectilinear portion of every circuit is located circumferentially around the casing at a location nearer to the first side of the casing having each of the first circuits, whereby the ball bearings in the second rectilinear portion are not able to contact both the sleeve and the shaft.

4,344,658

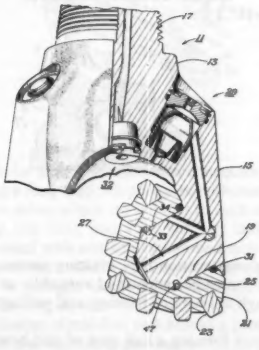
EARTH BORING DRILL BIT WITH SNAP RING CUTTER RETENTION

Leroy W. Ledgerwood, III, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Continuation of Ser. No. 8,504, Feb. 1, 1979, abandoned, which is a continuation of Ser. No. 846,643, Oct. 28, 1977, abandoned. This application Aug. 1, 1980, Ser. No. 174,483

Int. Cl.³ F16C *17/12*

U.S. Cl. 308—8.2 **7 Claims**



2. In combination with an earth bring bit having at least one cantilevered bearing shaft rotatably supporting a sealed and lubricated cutter, an improved cutter retention means comprising:

friction bearing means between said cutter and shaft, including an inwardly facing thrust surface and a generally cylindrical bearing surface;

one of said cutter and shaft having an assembly groove with inner and outer sidewalls and the other having a registering, retainer groove;

a snap ring with a portion that engages one of said sidewalls of the assembly groove when the cutter is thrust inward;

the retainer groove having a depth less than the full cross-sectional thickness of the ring measured in the direction of the groove depth;

the assembly groove having a depth at least equal to the cross-sectional thickness of the ring and one of said side-

walls intersecting the cylindrical bearing surface of the shaft to form an annular edge that engages said portion of the ring and confines it in the retainer groove when the cutter is subjected to inward thrust loading.

4. In combination with an earth boring bit having at least one cantilevered bearing shaft rotatably supporting a sealed and lubricated cutter, an improved cutter retention means comprising:

friction bearing means between said cutter and shaft, including an inwardly facing thrust surface and a generally cylindrical bearing surface on the shaft;

a selected one of the shaft and cutter having in the bearing surface an assembly groove with inner and outer sidewalls and the other having a registering, retainer groove;

a snap ring having a portion extending into the retainer groove;

the assembly groove having a depth greater than the cross-sectional thickness of the ring measured in the direction of the depth of the assembly groove;

the retainer groove having a depth less than the cross-sectional thickness of the ring measured in the direction of the depth of the retainer groove;

the shortest distance across the opening communicating between the registering assembly and retainer grooves, when the cutter is thrust inward, being less than the cross-sectional thickness of that portion of the snap ring in the retainer groove, measured across the opening communicating between the grooves, to prevent the snap ring from leaving the retainer groove.

4,344,659

SEALING CONSTRUCTION FOR A ROTATING PORTION AT A BICYCLE

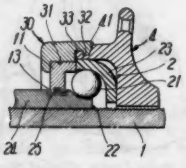
Keizo Shimano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jun. 10, 1980, Ser. No. 158,268

Claims priority, application Japan, Jun. 20, 1979, 54-85324[U]

Int. Cl.³ F16C *33/80, 19/06*

U.S. Cl. 308—187.1 **6 Claims**



1. A sealing construction for a rotating portion of a bicycle having a rotary member supported rotatably on a stationary member through at least one bearing, said sealing construction comprising:

a bearing cone forming a ball race of said bearing which is provided on one of said rotary and stationary members, said bearing cone having a cylindrical extension extending axially outwardly of said ball race,

a ring-like shaped sealing member formed by at least two sealing members, each of which forms part of said ring-like shape, said ring-like shaped sealing member being fixed to the other of said rotary and stationary members, and having an inner peripheral surface, formed by the inner peripheral surface of said first and said second sealing members, opposite to and surrounding said extension, the outer peripheral surface of said extension and opposing inner peripheral surface of said ring-like sealing member being provided with ridges and grooves which alternate in an axial direction of said extension and extend circumferentially of said extension and which intermesh with each other with a minimum interval therebetween to form a labyrinth seal; and,

fixing means for holding said first and second sealing members in close contact to form said ring-like shaped sealing member and for fixing said ring-like shaped sealing member to said other of said rotary and stationary members.

4,344,660

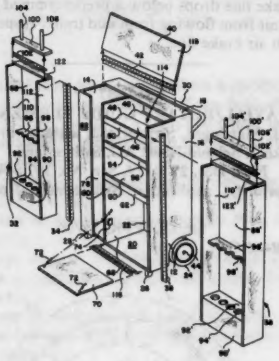
BASEBALL EQUIPMENT CABINET

Albert E. Molnar, Ringtown, Pa., and William J. Molnar, Phoenix, Ariz.

Filed Jun. 16, 1980, Ser. No. 159,786

Int. Cl.³ A47B *81/00;* A47F *7/00*

U.S. Cl. 312—250 **6 Claims**



1. In an equipment cabinet, the combination of

a main compartment defined laterally between a left side panel and a right side panel, transversely between a rear wall and front vertical panel and vertically between a top panel and a bottom panel,

the left and right side panels and the bottom panel extending transversely the entire depth of the cabinet,

the top panel being interconnected between the left and right side panels and being rigidly connected to the tops of the left and right side panels and the rear wall,

the top panel extending forwardly from the rear wall a transverse distance that is less than the depth of the cabinet to define a top opening;

the front vertical panel being connected to a side panel and extending laterally toward the other side panel a distance that is less than the lateral distance between the left and right side panels to define a front opening;

a vertical divider of height and depth equal to the side panels and positioned parallel to and intermediate the left and right side panels,

the divider subdividing the main compartment into a helmet compartment and a main storage area,

the said front opening exposing the entire front of the main storage area and only a portion of the front of the helmet compartment,

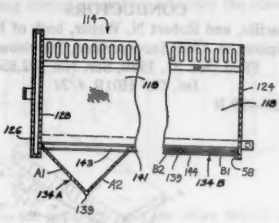
a left storage door hingedly connected to the left side panel and covering a portion of the said front opening; and

a right storage door hingedly connected to the right side panel and covering the remainder of the said front opening.

4,344,661
DRAWER ASSOCIATING CONSTRUCTIONS

John P. Gotberg, Box 551, Franklin, Mich. 48025

Continuation-in-part of Ser. No. 949,076, Oct. 6, 1978. This application Jan. 21, 1980, Ser. No. 115,246
Int. Cl.³ A47B 47/00; F16B 12/00
U.S. Cl. 312—330 R 16 Claims



1. A drawer assembly, comprising:

a first, upper drawer member including two upstanding side walls, an upstanding front wall and an upstanding rear wall;

at least one of said wall of said first, upper drawer member including means for removably securing a floor thereto for said first, upper drawer member;

a second, lower drawer member including two upstanding side walls, an upstanding front wall and an upstanding rear wall;

said second, lower drawer member further including a floor;

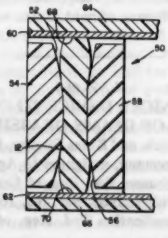
said first, upper drawer member being in vertical juxtaposition with said second, lower drawer member; and

said drawer assembly further including at least one securement member effectively releasably ganging at least one said wall of said first, upper drawer member to at least one said wall of said second, lower drawer member, so that pulling-out and pushing-in of either of said drawer members while said drawer members are so releasably ganged together will serve to pull out and push in both of said drawer members as a unit.

4,344,662
RETAINER FOR ELASTOMERIC ELECTRICAL CONNECTOR

Chris A. Dalamangas, Union, and Thomas P. Piccirillo, North Plainfield, both of N.J., assignors to Technical Wire Products, Inc., Cranford, N.J.

Continuation of Ser. No. 34,954, Apr. 30, 1979, Pat. No. 4,257,661, which is a continuation of Ser. No. 846,344, Aug. 28, 1977, abandoned. This application Jun. 27, 1980, Ser. No. 163,713
Int. Cl.³ H01R 13/00
U.S. Cl. 339—59 M 16 Claims



1. Retainer means for retaining an elastomeric electrical connector with layered electrical contacts in operable position between opposed sets of spaced electrically conductive areas, the retainer means comprising:

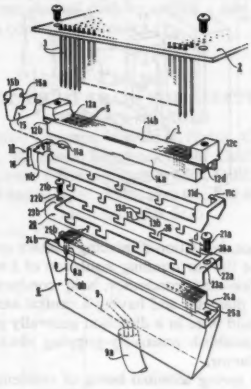
A. a generally planar body of electrically nonconductive material having top and bottom surfaces substantially parallel to said conductive areas,

B. at least one aperture through the body from the top surface to the bottom surface for receiving the elastomeric electrical connector, the at least one aperture being linearly elongated in a planar dimension of the body and having a top region and a bottom region separated by a central region, the opening of the at least one aperture in the central region being smaller than either the top or bottom region the top and bottom regions of the aperture smoothly diverging from the central region.

4,344,663
CONNECTOR-LOCKING DEVICE

Paul Ognier, Lannion, and Bernard Guilchier, Morlaix, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Apr. 8, 1980, Ser. No. 138,313
Claims priority, application France, Apr. 25, 1979, 79 10463
Int. Cl.³ H01R 13/62
U.S. Cl. 339—75 M 4 Claims



1. A device for locking an electrical connector having a first part including a face, which is provided with contacts of a first type, and two sides, which are parallel to each other and perpendicular to said face, and a second part including a face, which is provided with contacts of a second type for cooperating with the contacts of the first type when the face of the second part is brought close to the face of the first part, wherein the locking device comprises:

each of said sides of said first part having a groove located at each end and extending parallel to the face of said first part;

a first locking piece consisting of a one-piece channel-shaped member;

means for mounting the first locking piece on said first part for slidable translation in a direction parallel to said face between a locking position and an unlocking position, said means for slidably mounting the first locking piece on the first connector part comprising two pairs of tabs formed integrally with said channel-shaped member, one pair adjacent to each end thereof, the tabs of each pair being inserted into the respective grooves at the corresponding end of the first connector part;

spring means interposed between the first part and the first locking piece for biasing said first locking piece into the locking position;

a second locking piece mounted on said second part, one of said first and second locking pieces having two spaced

apart edges parallel to the corresponding face of the respective part with hooked members extending from said edges perpendicularly to and outwardly of the plane of the corresponding face, and the other of said locking pieces having apertures corresponding to said hooked members, each aperture having a shape complementary to that of the corresponding hooked member;

and

means for fastening the second locking piece in fixed relation to said second connector part.

4,344,664

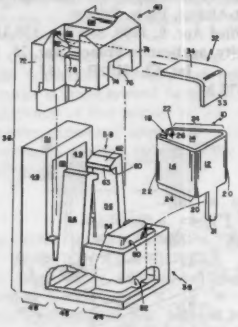
WIDE COMPLIANCE INSULATION DISPLACEMENT TERMINAL BLOCK

William B. Walkup, Southboro, Mass., assignor to Ark-Les Corporation, Watertown, Mass.

Filed Oct. 3, 1980, Ser. No. 193,652

Int. Cl.³ H01R *13/38*

U.S. Cl. 339—99 R **10 Claims**



1. A one-piece, insulation-displacing contact spring terminal adapted to slice the surrounding insulation of a wire comprising an insulation-clad conductor, said conductor having a predetermined diameter and having a central axis, by relative movement of said wire in a direction generally perpendicular to its axis to establish positively-gripping electrical contact with said conductor,

said contact spring terminal being of resilient, electrically conductive sheet metal of at least five times greater width than thickness and having

a generally flat trunk and

a pair of opposing spring arms integrally connected to said trunk at opposite sides thereof, each said spring arm being longer than the length of said trunk, said spring arms having opposed, widthwise-extending, insulation-slicing, generally parallel, wire-contacting edges of reduced thickness remote from said trunk and lying generally in a single plane and spaced from one another to define a wire-receiving slit (18) therebetween narrower than the diameter of said conductor,

the portion of a said spring arm extending between said trunk and said edges having

a rounded trunk corner adjacent said trunk and

a rounded edge corner adjacent said edge

with an longitudinally-extended, generally straight connecting portion therebetween,

said connecting portion being bent at

an included angle with said trunk of less than about ninety degrees and

an included angle with the plane of said opposed edges of greater than about ninety degrees,

said wire-contacting edges having at at least one end thereof opposed beveled corners for receiving, engaging and slicing the surrounding insulation of said wire by movement of said wire relative to said terminal between said corners and into said slit between said opposed edges in a direction generally perpendicular to the axis of said wire and of said plane and through said slit to establish positively-gripping electrical contact between said contact spring terminal and said wire conductor.

4,344,665

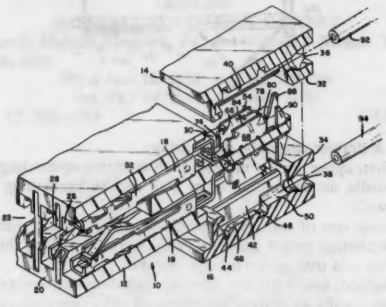
CONNECTOR FOR MASS TERMINATING INDIVIDUAL CONDUCTORS

John J. Racilla, and Robert N. Weber, both of Hummelstown, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 31, 1980, Ser. No. 202,854

Int. Cl.³ H01R *4/24*

U.S. Cl. 339—99 R **6 Claims**



1. A connector for terminating a plurality of individual insulated conductors in gang fashion, said connector comprising:

a housing of insulative material having a front mating face and a rear terminating portion with a plurality of terminal passages extending therebetween in parallel spaced fashion in at least one row, said rear terminating portion of said housing being outwardly and rearwardly open;

a cover mating with said open rear terminating portion of said housing, said cover having an inwardly directed pusher surface and crimp means associated with each said terminal passage and a rear wall enclosing said open rear terminating portion;

a plurality of apertures in said rear wall each opening into a respective one of said passages, and means in said cover aligned with each respective aperture for engaging and restraining a conductor; and

a plurality of terminals each mounted in a respective passage, each said terminal having a mating portion directed towards said front mating face and an insulation piercing conductor engaging portion and strain relief means both lying in said rear terminating portion of said housing, whereby a plurality of conductors received in said cover are driven by said cover pusher surfaces into said insulation piercing conductor engaging portions of respective terminals and said strain relief means is crimped against a conductor by closure of said cover with respect to said housing.

4,344,666

OPTO-MECHANICAL DEVICE TO CONTROL THE DIRECTION OF BEAMS OF VISIBLE LIGHT

Klaus Birgmeir, Munich, and Klaus Stadler, Irschenhausen, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 7, 1980, Ser. No. 166,252

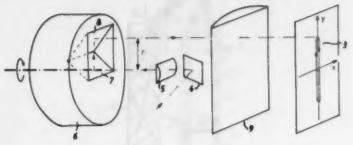
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1979, 2927199

Int. Cl.³ G02B *27/17*

U.S. Cl. 350—6.9 **8 Claims**

1. An opto-mechanical device to control the direction of

beams of visible light utilizing a movable optical component and adapted to deflect an incident beam of light in a desired direction and comprising a first optical component by which an incident beam of light can be converted into a rotating beam of light, said first optical element including a rotating mirror assembly having at least two mutually perpendicular reflecting mirrors; a relay mirror and a first cylinder lens which focuses in a Y coordinate direction direct the incident beam of light onto the rotating mirror assembly, whereby the rotating beam



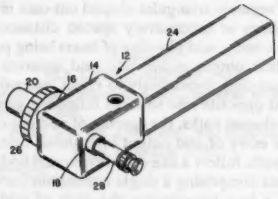
of light is reflected back towards the relay mirror parallel to the axis of rotation of the mirror assembly; and a second optical element, the produced rotating beam of light being focused in only one direction by the second optical element to be projected in a desired region, both optical elements cooperating with each other in a fashion that the deflected beam of light is focused in the desired region; and the second optical element including a second cylinder lens which focuses in a X-coordinate direction and is located after the rotating mirror assembly.

4,344,667

INTEGRATED BEAM SPLITTER AND ADJUSTABLE LIGHT INTENSITY CONTROL ADAPTER

Edward A. Wooff, Jr., Ventura, Calif., assignor to Circon Corporation, Santa Barbara, Calif.

Filed May 30, 1980, Ser. No. 154,874
Int. Cl.³ G02B 7/00, 27/10
U.S. Cl. 350—80 **12 Claims**



1. An integrated beam splitter and adjustable light intensity control adapter comprising

a housing including a first hollowed-out area located at one end thereof and a pair of axially aligned openings, one of which extends from the exterior of a surface of the housing into the interior of said first hollowed-out area and the other of said opening extending from the interior of said first hollowed-out area to the exterior of an opposed surface of the housing, said housing including a second hollowed-out area which is located substantially perpendicular to and which communicates with said first hollowed-out area, said second hollowed-out area having an aperture which extends from the interior of said second hollowed-out area to the exterior of a planar surface of said housing, which planar surface is substantially perpendicular to said surface and said opposed surface having one of said pair of openings;

means operatively connected to said housing for attaching an optical device, which is adapted to produce an optical image to the housing wherein a said optical image is directed through said one of said pair of openings and into said first hollowed-out area and out through the other of said pair of openings;

viewing means operatively coupled to said housing and positioned in axial alignment with said other one opening of said pair of openings to enable a viewer to observe a said optical image from a said optical device;

a beam splitter positioned within said first hollowed-out area and between said pair of openings to receive through said one opening said optical image and for passing a portion of a said optical image at a light intensity which is less than one-half of the intensity of a said optical image through a first optical path including said other opening and through said viewing means and for deflecting the remainder of said optical image through a second optical path substantially perpendicular to the axis of said axially aligned pair of openings;

a prism positioned within said first hollowed-out area and adjacent said beam splitter and along said second optical path to receive and deflect the remainder of a said optical image from said beam splitter into said second hollowed-out area and through said aperture;

light intensity adjusting means positioned in said second hollowed-out area and along said second optical path between said prism and aperture for controlling the intensity of that portion of a said optical image at the planar surface of the housing; and

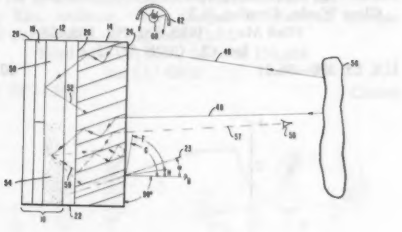
means including a lens operatively coupled to said housing on said planar surface at said aperture for coupling a recording means to said second hollowed-out area along said second optical path to record a said optical image having a controlled intensity.

4,344,668

FIBER OPTIC LIGHT TRAPS FOR ELECTRO-OPTICAL DISPLAY DEVICES

John E. Gunther, Torrance; William R. Lichty, Culver City, and William C. Hoffman, Torrance, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 17, 1980, Ser. No. 130,638
Int. Cl.³ G02B 5/16
U.S. Cl. 350—96.27 **21 Claims**



1. A display device comprising:

(a) an electro-optical display panel having a specularly reflecting display surface; and

(b) a fiber optic faceplate having a back major surface and a front major surface aligned at a predetermined angle β to one another, wherein said back surface is parallel to and adjacent said display surface, wherein said faceplate has a multiplicity of optical fibers, each of said fibers having an acceptance solid angle which defines exclusively the angular range through which light is transmitted by said fibers, wherein said fibers have longitudinal axes which are parallel to a plane passing through a perpendicular to said back surface and a perpendicular to said front surface, and which are slanted at an acute angle α to said perpendicular to said back surface, and wherein said angle α is selected such that light which enters said front surface and is specularly reflected from said display surface back into said faceplate is directed outside of said acceptance solid angle.

4,344,669

COATED GLASS FIBERS FOR OPTICAL TRANSMISSION

Naoya Uchida, Mito; Masaaki Yoshida, and Toru Yamanishi, both of Yokohama, all of Japan, assignors to Nippon Telegraph & Telephone Corporation, Tokyo and Sumitomo Electric Industries, Ltd., Osaka, both of, Japan

Filed Nov. 7, 1979, Ser. No. 91,997
Claims priority, application Japan, Nov. 7, 1978, 53/137660
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.30 5 Claims

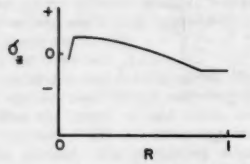
1. A glass fiber for use in optical transmission which comprises a first layer containing an organopolysiloxane having a refractive index higher than that of the glass which forms the outermost layer of the glass fiber, a second layer comprising an organopolysiloxane which is the same or different than the organopolysiloxane in the first layer, and a thermoplastic resin coated on the second layer in a thickness less than about 100 microns.

4,344,670

OPTICAL WAVEGUIDE SOOT PREFORM WITH REDUCED INNER LAYER STRESS AND METHOD OF MAKING

Michael G. Blankenship, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed May 1, 1980, Ser. No. 145,445
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.31 10 Claims



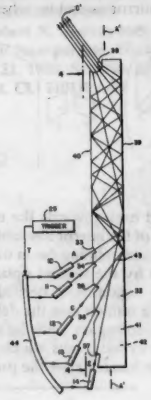
6. A cylindrical optical waveguide soot preform comprising a longitudinal center hole and a surrounding preform body comprising a core portion have a radially varying composition, the core portion being composed of a plurality of concentric core layers of vitreous soot including an inner layer defining the cylindrical surface of the longitudinal center hole and outer layers making up the remainder of the core portion, the soot layers proximate to the inner layer containing higher concentrations of refractive-index-increasing dopants than soot layers positioned exteriorly thereof, and being in a state of tensile stress at ambient temperatures, wherein, following soot deposition but prior to any treatment to remove residual water or consolidated the preform to clear glass, the inner layer defining the center hole of the preform has a thermal expansion coefficient lower than that of at least one of the layers proximate thereto, so as to exhibit a reduced level of tensile stress with respect to said proximate layer at ambient temperatures.

4,344,671

MULTIPLE PULSE LASER ASSEMBLIES

Paul W. Lang, Orange, Calif., assignor to Raymus K. Payton, Newport Beach, Calif.

Filed Dec. 17, 1979, Ser. No. 104,186
Int. Cl.³ G02B 27/14
U.S. Cl. 350—174 2 Claims



1. A multiple pulse laser assembly including, in combination:
(a) a plurality of pulse lasers, each generating a giant pulse of coherent light in response to a trigger signal received thereby;
(b) an elongated body of light transmissive material having light entrance means and light exit means, in which said elongated body has a pair of opposite parallel polished side surfaces, said light entrance means comprising a plurality of separate triangular-shaped cut-outs in one of said side surfaces at successively spaced distances from one end of the body, said plurality of lasers being positioned to direct their output pulses into said separate triangular-shaped cut-outs respectively to effect internal reflections from said opposite side surfaces following generally saw-toothed-shaped paths, the spacing of said cut-outs and the angles of entry of said output laser pulses being such that no two paths follow a like direction in said body, said light exit means comprising a single continuous curved cut-out defining a lens intercepting the ends of said paths and directing exiting light along in parallel directions;
(c) a trigger means for providing a trigger signal for said lasers; and,
(d) delay line means connected to said trigger means and having tap off points to said pulse lasers so that said trigger signal travels down said delay line means to trigger successively said pulse lasers at predetermined time intervals such that the output pulses from said lasers exit from said light exit means in said body substantially simultaneously.

4,344,672

TRUCK MIRROR WITH OVERLYING BOTTOM END COVER

Arthur F. Bielweiss; Dimitru Cotoara, both of Toronto, and Robert J. Wilkes, Caledon, all of Canada, assignors to Dominion Auto Accessories Limited, Toronto, Canada

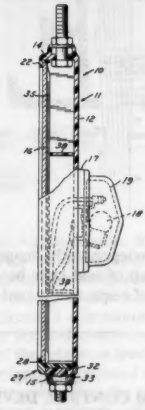
Filed Dec. 29, 1980, Ser. No. 221,062
Int. Cl.³ G02B 7/18
U.S. Cl. 350—288 5 Claims

1. A truck mirror comprising a unitary housing having a back wall, side walls and top and bottom walls defining a generally, rectangular opening,
said side walls having inwardly extending spaced flanges,

said bottom wall terminating short of the side walls so that a mirror can be inserted by sliding longitudinally upwardly through the spaced flanges toward the top wall,

a top end cover member interposed between said top edge of said mirror and said top wall,

said member having end portions extending laterally behind said outermost flange along said side walls,



a bottom end cover interposed between the bottom edge of said mirror and said bottom wall of said housing,

said bottom end cover having portions thereof extending upwardly along the outer face of the lower edge of the mirror,

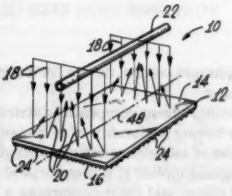
said bottom end cover having portions thereof extending inwardly in overlying relation to said bottom wall of said housing.

4,344,673

FOCUSING REFLECTOR

David W. Holdridge, Fullerton, Calif., assignor to Swedlow, Inc., Garden Grove, Calif.

Filed Sep. 29, 1980, Ser. No. 192,431
Int. Cl.³ G02B 5/08
U.S. Cl. 350—292 **19 Claims**



9. A focusing reflector for redirecting light form a light source to a prescribed focal zone, comprising:

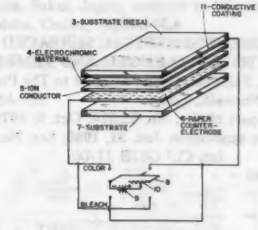
a reflector sheet formed from a transparent material and having an upper face with a generally smooth surface for presentation toward the light source, and a lower face defined by an array of downwardly depending reflective elements each having a pair of reflector facets oriented substantially perpendicular to each other and a focusing facet oriented with respect to said reflector facets at a preselected angle for cooperating with said reflector facets to reflect light incident upon said upper face to the prescribed focal zone, said angular orientation of said focusing facets of adjacent ones of said elements changing progressively with changes in the distance of said elements from the focal zone.

4,344,674

ELECTROCHROMIC DISPLAY DEVICE WITH IMPROVED ERASING CHARACTERISTIC

Robert D. Giglia, Rye, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jul. 18, 1980, Ser. No. 157,612
Int. Cl.³ G02F 1/17
U.S. Cl. 350—357 **12 Claims**



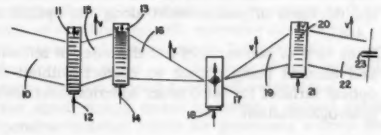
1. An electrochromic device comprising a film of persistant electrochromic inorganic compound, an electrode layer on one side of said film, an electrolyte layer on the opposite side of said film, a conductive counter electrode layer on the opposite side of said electrolyte layer, said counter electrode layer comprising an electrochemically reversible oxidizing agent having oxidizing electrode potential more negative than carbon to increase the open circuit potential of said device when the film of electrochromic material is in its colored state.

4,344,675

OPTICAL SIGNAL PROCESSING DEVICE

Shi-Kay Yao, Anaheim, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 29, 1980, Ser. No. 154,358
Int. Cl.³ G02F 1/11
U.S. Cl. 350—358 **7 Claims**



1. An optical system comprising:

input means for providing a radio frequency input signal;

chirp means for providing a substantially linearly frequency modulated chirp signal of constant amplitude;

a source for emitting a beam of radiation;

first acousto-optical modulation means disposed in the path of said beam, and connected to said input means and driven by said input signal, said first acousto-optical modulation means functioning to modulate said beam with said radio frequency input signal to produce a first modulated beam;

second acousto-optical modulation means disposed in the path of said first modulated beam, and connected to said chirp means and driven by said chirp signal, said acousto-optical modulation means functioning to modulate said beam with said chirp signal to produce a second modulated beam;

means for providing a filter signal representing a predetermined filter function to be applied to said input signal;

acousto-optical filter means disposed in the path of said second modulated beam and functioning to modulate said beam with said filter signal to produce a third modulated beam;

lens means disposed in the path of said third modulated beam for collimating the third modulated beam to produce a fourth collimated modulated beam; and

detector means disposed in the path of said fourth modulated beam for detecting the optical intensity distribution at the focal point thereof.

4,344,676

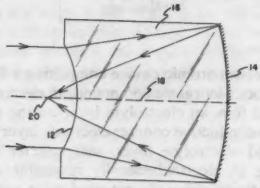
SINGLE ELEMENT SPHERICAL SURFACED OPTICS INSENSITIVE TO WAVELENGTH AND TEMPERATURE

David R. Shafer, Fairfield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 82,814, Oct. 9, 1979, Pat. No. 4,331,390. This application Jan. 31, 1980, Ser. No. 117,032

Int. Cl.³ G02B *17/00*

U.S. Cl. 350—444 **2 Claims**



1. An optical system comprising,

(A) a single transparent element;

(B) first and second spherical surfaces on said element, said first surface being negatively curved and said second surface being a mirror, each of said surfaces on said element having

(a) a common axis, and

(b) different centers of curvature,

(C) said element being chosen from the group consisting of fused silica and BK-7 and the radius of said first surface is -1.0569, the radius of said second surface is -2.7174, and the thickness of said element along the optical axis is 1.4867,

(D) the radii of said surfaces and the index of refraction of said element being chosen to correct without further optical surfaces for third order spherical aberration and spherochromatism.

4,344,677

LASER PRINTER WITH MULTIPLE SCANNING BEAMS

Paul A. Stuermer, and Richard N. Blazey, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 70,230, Aug. 27, 1979, abandoned. This application Apr. 14, 1981, Ser. No. 301,705

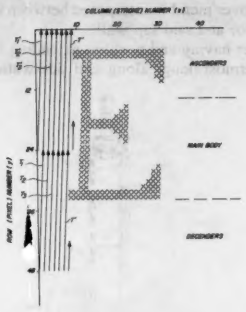
Int. Cl.³ G06K *15/12*; H04N *1/22*

U.S. Cl. 354—5 **7 Claims**

1. Laser printer apparatus with an improved resolution/-speed characteristic for scan-imaging an information strip of relatively high transverse pixel density along a linear imaging zone, said apparatus comprising:

(a) means for producing at least two laser beams;

(b) means for simultaneously deflecting said laser beams respectively along adjacent, partial-width, linear regions of said linear imaging zone in both column-wise and row-wise directions so as to scan row-wise spaced sets of tandem, multi-pixel columns, one multi-pixel column of each such set being scanned by each of said beams; and



(c) means for independently imagewise modulating the intensity of each of said laser beams during their simultaneous scans of respective partial-width regions.

4,344,678

DIAPHRAGM CONTROL DEVICE FOR CAMERA

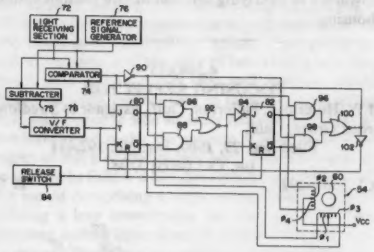
Kazunori Mizokami, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1980, Ser. No. 187,763

Claims priority, application Japan, Sep. 18, 1979, 54/119723

Int. Cl.³ G03B *7/095*

U.S. Cl. 354—23 D **13 Claims**



11. A diaphragm control device for a camera having a shutter, comprising:

stepping motor means comprising a stator having an electromagnet having a plurality of poles, an excitation state of said poles of said electromagnet changing in response to a pulse signal supplied to said stator; and a rotor surrounded by said stator, said rotor comprising a permanent magnet having a plurality of poles, rotating through a predetermined angle every time an excitation state of said stator changes and being balanceable in a plurality of positions at the time of initial excitation of said stator;

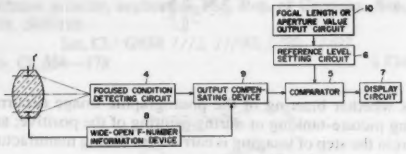
light receiving means for supplying to said stator a pulse signal in accordance with the brightness of a subject, said pulse signal comprising a plurality of pulses, the number of pulses of said pulse signal be supplied to said stator being determined to cause said rotor to rotate through less than half the angle necessary for said rotor to rotate from one balanced position to an adjacent balanced position; and

diaphragm means coupled to said motor means and having its diaphragm opening set in accordance with the rotation angle of said rotor.

4,344,679
CAMERA WITH PHOTOELECTRIC FOCUS DETECTING DEVICE

Michio Yagi, Hachioji, and Hiroshi Sawano, Tokorozawa, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 1, 1979, Ser. No. 80,585
Claims priority, application Japan, Oct. 2, 1978, 53-120441
Int. Cl.[3] G03B *13/18, 17/18*
U.S. Cl. 354—25 1 Claim

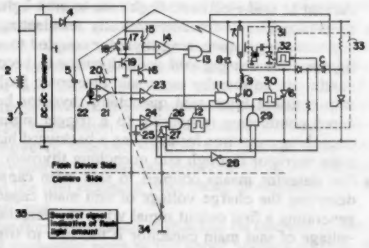


1. A camera including a photoelectric focus detecting device, comprising: a focused condition detecting circuit made receptive of the light coming from an objective lens for generating output signals according to the focused condition; a reference level setting circuit; a comparator circuit for comparing the output of the focused condition detecting circuit and the reference level of the reference level detecting circuit; display circuit for displaying the compared results of the comparator circuit; means for controlling the reference level setting circuit thereby to vary a reference level in accordance with a range of depth of focus or field of the objective lens, a wide-open F-number information device for generating an information indicative of a difference in a wide-open F-number of an interchangeable lens; and an output compensating device connected between the focused condition detecting circuit and the comparator circuit, whereby the output compensating device is controlled by the output of the wide-open F-number information device.

4,344,680
PHOTOGRAPHIC DEVICES FOR CONTROLLING FLASH PHOTOGRAPHY

Tokuji Ishida, Daito; Nobuyuki Tanigue[illegible]atoshi Itoh, both of Sakai; Toshiaki Matsumoto, Izumisano; [illegible]atsuro Izumi, and Masatake Niwa, both of Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 31, 1981, Ser. No. 249,404
Claims priority, application Japan, Apr. 9, 1980, 55-47240
Int. Cl.[3] G03B *15/05;* H05B *41/34*
U.S. Cl. 354—33 23 Claims

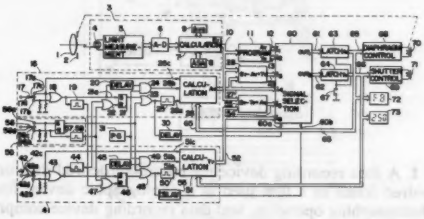


1. Photographic system for flash photography, comprising:
an electronic flash tube;
means for supplying firing current to said electronic flash tube;
means for selectively restricting said firing current;
means for detecting whether or not the flash light amount necessary for a flash photograph is below a predetermined level prior to the firing of said flash tube for photographic exposure;
means for selecting said restricting means to actually restrict said firing current when said detecting means detects that said necessary flash light amount is below said predetermined level; and
means for controlling the operation of said flash tube such that the flash light emission therefrom substantially corresponds to said necessary flash light amount.

4,344,681
SELECTION AND SETTING DEVICE FOR CAMERA EXPOSURE CONTROL

Seiji Yamada, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 25, 1981, Ser. No. 238,029
Claims priority, application Japan, Feb. 26, 1980, 55-23892
Int. Cl.[3] G03B *7/08*
U.S. Cl. 354—38 7 Claims



1. A multi-mode camera exposure control device for controlling exposure in at least the shutter speed priority, diaphragm aperture priority and program photographic modes, comprising:
light measuring means for detecting the light from a scene to be photographed and generating a light-related output;
program control signal generator means for generating a first diaphragm value signal and a first shutter value signal as a function of said light-related output;
diaphragm aperture setting means including a first manually operative member, means for generating a second diaphragm value signal in dependence on the operation of said first manually operative member, and means for generating a first mode control signal in response to the operation of said first manually operative member;
shutter speed calculation means for generating a second shutter value signal as a function of said light-related output and said second diaphragm value signal;
shutter speed setting means including a second manually operative member, means for generating a third shutter value signal in dependence on the operation of said second manually operative member, and means for generating a second mode control signal in response to the operation of said second manually operative member;
diaphragm aperture calculation means for generating a third diaphragm value signal as a function of said light-related output and said third shutter value signal;
program mode selection means including a third manually operative member and means for generating a third mode control signal in response to the operation of said third manually operative member;
selector means for selecting one pair of said first, second and third diaphragm and shutter value signals in dependence on which of said first, second and third mode control signals is generated;
diaphragm control means for controlling the diaphragm aperture in accordance with the diaphragm control signal selected by said selector means, and
shutter control means for controlling the shutter speed in

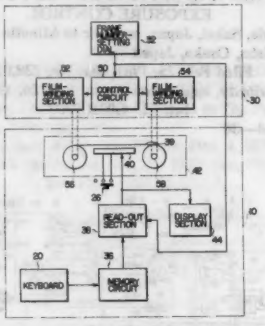
accordance with the shutter control signal selected by said selector means.

4,344,682

DATA RECORDING DEVICE

Shinichiro Hattori, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 17, 1980, Ser. No. 217,232
Claims priority, application Japan, Dec. 27, 1979, 54/172005
Int. Cl.³ G03B *1/18, 17/24, 29/00*
U.S. Cl. 354—62 7 Claims



1. A data recording device for recording desired data on a desired frame of a film used in a photographic device for a photographing operation, said data recording device comprising:

data generating means having an output for generating data corresponding to a frame of the film and recording data;

memory means having an output and an input connected to the output of said data generating means for storing the data output from said data generating means;

frame-specifying means having an output for outputting a signal corresponding to a desired frame selected from the film frames;

film-driving means having an input connected to the output of said frame-specifying means for positioning the desired frame to a predetermined position in response to the signal from said frame-specifying means;

read-out means having an output and inputs connected to the outputs of said memory means and said frame-specifying means, respectively, for reading out desired recording data from said memory means in response to the signal output from said frame-specifying means;

data recording means having an input connected to the output of said read-out means for copying the recording data output from said read-out means onto the desired frame of the film; and

means for displaying at least the recording data read out by said read-out means.

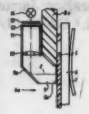
4,344,683

QUALITY CONTROL METHOD AND APPARATUS FOR PHOTOGRAPHIC PICTURES

Otto Stemme, Munich, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 18, 1980, Ser. No. 188,278
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1979, 2939681
Int. Cl.³ G03B *27/52, 27/32, 17/24*
U.S. Cl. 354—106 3 Claims

1. A quality control method for photographic pictures, comprising the steps of imaging a test pattern onto a marginal area of a film frame, the test pattern being a raster pattern having zones of different raster frequency and including a component indicative of image sharpness; upon conversion of the film frame into a negative, printing the test pattern in a marginal area of a positive made from the negative so that, in the event the photographic image on the positive is blurred, the absence or presence of blurring of the printed test pattern indicates whether blurring of the photographic image occurred during picture-tanking or during printing of the positive; and wherein the step of imaging is carried out during manufacture of the photographic film.

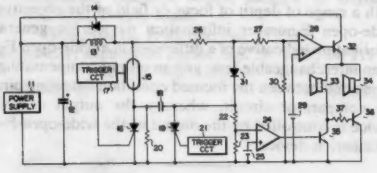


4,344,684

AUTOMATIC PHOTOFLASH DEVICE

Takashi Tsukaya, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1981, Ser. No. 236,903
Claims priority, application Japan, Feb. 27, 1980, 55/23872
Int. Cl.³ G03B *15/02*
U.S. Cl. 354—128 3 Claims



1. An automatic photoflash device comprising:

an electronic flash tube;

a source of power;

a main capacitor coupled to said electronic flash tube and coupled to said power source so as to be charged to a predetermined voltage by said power source for supplying a discharge current to said electronic flash tube;

a main thyristor connected in series with said electronic flash tube;

means for rendering said main thyristor conductive to thereby cause said main capacitor to supply said discharge current to said electronic flash tube to emit light;

a quenching circuit for automatically terminating a flash, and including a quenching thyristor coupled to said main thyristor for causing said main thyristor to become non-conductive to thereby cause said electronic flash tube to stop emitting light, said quenching thyristor being rendered conductive responsive to a trigger signal, and a quenching capacitor for applying a backward bias to said main thyristor through said quenching thyristor;

a first detector means coupled to said main capacitor for detecting the charge voltage of said main capacitor and generating a first output signal when the detected charge voltage of said main capacitor is too low to trigger said electronic flash tube;

a second detector means coupled to said quenching capacitor for detecting the charge voltage of said quenching capacitor and generating a second output signal when the detected charge voltage of said quenching capacitor is lower than a predetermined value; and

an alarm means coupled to said first and second detector means for indicating, in response to said first output signal, that said electronic flash tube is unable to emit light, and

for indicating, in response to said second output signal, that automatic flash termination is impossible.

4,344,685

PHOTOGRAPHIC CAMERAS

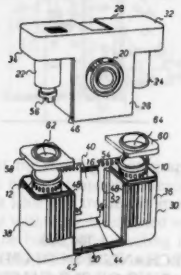
Erhard Milatz, Langenfeld, and Hans Schmidt, Monheim, both of Fed. Rep. of Germany, assignors to Robot Foto & Electronic GmbH & Co. K.G., Dusseldorf, Fed. Rep. of Germany

Filed Sep. 14, 1979, Ser. No. 75,740

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1978, 2839910

Int. Cl.³ G03B 1/12, 17/00, 1/00, 17/02

U.S. Cl. 354—173 6 Claims



1. Photographic camera comprising:

a hollow sleeve-shaped supply spool and a hollow sleeve-shaped take-up spool, a film track and a film engaging plate between said spools,

a camera objective, which is arranged to produce a real image in the plane of the film track,

a film driving motor which is coupled to the take-up spool,

an electronic control device and

a battery arranged to supply energy to the film driving motor and to the electronic control device, characterized in that

(a) the camera objective and the film track are provided on a generally block-shaped central housing body on opposite sides (front and read face) thereof,

(b) an upper housing portion is located on the upper side of the central housing body and extends on both sides beyond the central housing body,

(c) a lower housing portion forms a chamber member of substantially rectangular cross section below each of the laterally projecting parts of the upper housing body, said chambers accommodating said supply and take-up spools, respectively, said two chamber members being open towards the top and being interconnected by a rear wall and by a bottom plate, whereby a space is defined between the chamber members and the bottom plate, into which space the central housing body is removably inserted, vertical film passage slots being provided in the chamber members along the rear wall, and the film engaging plate being mounted on the rear wall, and

(d) the film drive motor is attached on one side to one of the projecting parts of the upper housing portion, and the battery is attached to the other one of the projecting parts on the other side of the upper housing portion, said film drive motor and said battery extending therefrom downwardly into the hollow take-up spool and supply spool, respectively, a coupling member mounted on the film drive motor being coupled directly to the take-up spool, when the central housing body is inserted.

4,344,686

PHOTOGRAPHIC CAMERA WITH STATE-OF-FOCUS INDICATION

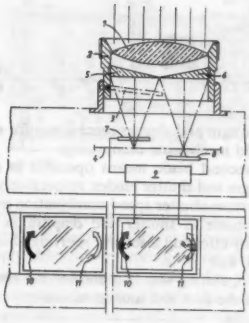
Otto Stemme, Munich; Peter Lermann, Narring, and Istvan Cocron, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 952,264, Oct. 18, 1978, abandoned. This application Mar. 24, 1980, Ser. No. 133,127

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1977, 2746920

Int. Cl.³ G03B 13/18, 13/02

U.S. Cl. 354—198 5 Claims



1. An improved system for facilitating manual focussing of a camera objective in a manner that an image of a photographic subject is sharply focussed on a reference plane, the system utilizing displays located in a camera viewfinder in order to inform a user as to a direction in which the objective is to be rotated in order to focus the image, comprising:

a splitter located intermediate the objective and the reference plane, the splitter splitting the image into first and second parts;

a first light detector located in front of the reference plane between the reference plane and the splitter and being aligned with the first part, the first light detector generating a first electrical signal characteristic of light intensity of the first part at the first light detector;

a second light detector located behind the reference plane and being aligned with the second part, the second light detector generating a second electrical signal characteristic of light intensity of the second part at the second light detector;

a first display located in the camera viewfinder, the first display being shaped into an arrow pointing clockwise;

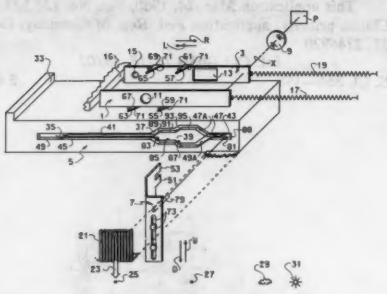
a second display located in the camera viewfinder, the second display being shaped into an arrow pointing counterclockwise; and

a comparator responding to the electrical signals and being connected to the displays so as to cause the first display to be energized when the objective must be rotated manually clockwise as viewed by a user in order to focus the image on the reference plane and so as to cause the second display to be energized when the objective must be manually rotated counterclockwise as viewed by a user in order to focus the image on the reference plane.

4,344,687
DIAPHRAGM AND SHUTTER MECHANISM

Robert P. Cloutier, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 18, 1981, Ser. No. 235,492
Int. Cl.[3] G03B 9/40
U.S. Cl. 354—246 10 Claims



1. A diaphragm and shutter mechanism for exposing film in a camera, said mechanism comprising:

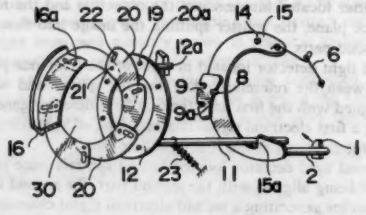
first and second blade means operable in a first mode as diaphragm and shutter blades, respectively, for effecting a first aperture-shutter speed combination and operable in a second mode as shutter and diaphragm blades, respectively, for effecting a second aperture-shutter speed combination; and

means for operating said first and second blade means selectively in the first and second modes.

4,344,688
INTERCHANGEABLE LENS ASSEMBLY

Tsuneyo Metabi, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 5,747, Jan. 23, 1979, abandoned. This application Mar. 18, 1980, Ser. No. 131,343
Claims priority, application Japan, Jan. 31, 1978, 53-9782
Int. Cl.[3] G03B 9/07, 17/00
U.S. Cl. 354—272 12 Claims



1. In an interchangeable lens assembly detachably mountable to a camera body including reciprocating means which is displaced from an initial position prior to the commencement of an exposure and returns to the initial position upon the completion of the exposure, the combination comprising:

a diaphragm mechanism including a diaphragm drive ring for forming an adjustable diaphragm aperture;

a control member integrally connected to said diaphragm drive ring and defining therewith a diaphragm control unit for controlling the opening of said diaphragm aperture;

a first spring directly connected to and biasing said control unit in a direction to open said diaphragm aperture;

an actuating member movable between a cocked position and a released position for directly engaging and advancing said control member in a direction to close the diaphragm aperture when said actuating member is displaced to said released position and being drive uncoupled from said control member when said actuating member is moved back to said cocked position;

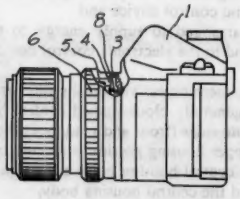
second biasing means for biasing said actuating member from said cocked to said released position;

interlocking means for drive intercoupling said actuating member with said reciprocating means when said interchangeable lens is mounted to the camera body whereby said actuating member is maintained in said cocked position when said reciprocating means is in its initial position and said actuating member is permitted to move toward said release position when said reciprocating means is displaced from its initial position; and means for adjustably limiting the amount of the movement of said actuating member.

4,344,689
LOCKING MECHANISM IN DIAPHRAGM SETTING RING OF SLR CAMERA

Shinsuke Kohmoto, and Yasuyuki Haneishi, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1981, Ser. No. 237,986
Claims priority, application Japan, Feb. 25, 1980, 55-24144[U]
Int. Cl.[3] G03B 17/00; G02B 7/02
U.S. Cl. 354—286 13 Claims



1. In a camera having a camera body, an interchangeable lens engageable with the camera body, and a rotatable diaphragm setting ring on the lens, the ring being rotatable between an automatic diaphragm control position and a range of diaphragm presetting positions, an improvement comprising:

a first mounting member on the camera body;

a second mounting member on the lens, the second mounting member interlocking with the first mounting member to engage the lens with the camera body;

a hole formed in the second mounting member adjacent to the first mounting member;

a slideable lock pin disposed in the hole;

means responsive to the diaphragm setting ring for retracting the pin to a position approximately flush with the surface of the second mounting member when the diaphragm setting ring is within the range of diaphragm presetting positions; and

means responsive to the diaphragm ring for extending the lock pin outwardly from the surface of the second mounting member to the region occupied by the first mounting member when the diaphragm setting ring is at the automatic diaphragm control position.

4,344,690

ARRANGEMENT FOR TREATING PHOTOGRAPHIC BANDS RUNNING IN PARALLEL PATHS

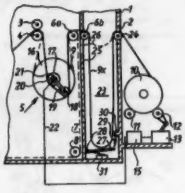
Wolfgang Viehrig, Munich; Viktor Osegowitsch, Taufkirchen, and Thomas Hammer, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 14, 1980, Ser. No. 178,343

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1979, 2934984

Int. Cl.³ G03D *3/13*

U.S. Cl. 354—319 18 Claims



1. An arrangement for treating photographic paper bands which run in parallel paths, comprising means for treating the bands and forming at least one treatment station in which the bands are transported with a predetermined speed and treated; means for winding the bands after treating in said treatment station and located downstream of said treatment station; means for driving said winding means independently of the transportation of the bands in said treatment station and with a speed exceeding the speed of transportation of the bands in said treatment station; means for accumulating the bands between said treatment station and said winding means so that a loop of the bands is formed in said accumulating means; means for switching said driving means on and off in dependence upon a size of the loop of the bands in said accumulating means, said switching means including a microswitch arranged to act in response to the weight of a desirable maximum size of the loop; a pivotable plate against which the loop can abut and which, in turn, acts upon said microswitch so as to actuate the same in an operative position of said plate; and a spring arranged to hold said plate in an inoperative position so that the actuation of said microswitch directly depends upon the loading of said plate by the loop.

4,344,691

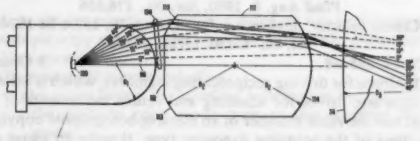
ZONAL CONCENTRATOR FOR ACCURATE ERASURE OF PHOTOCONDUCTOR CHARGE

Duane E. Grant, Boulder, and James R. Walker, Longmont, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 23, 1980, Ser. No. 162,216

Int. Cl.³ G03B *27/00, 27/54*

U.S. Cl. 355—1 14 Claims



8. In an electrophotographic machine of the transfer type wherein erase mechanisms are included for shaping the charged image area of a moving photoreceptive surface to the dimensions of the image, the improvements comprising:

an array of LEDs for producing light rays to erase charge outside of said image area, said array located adjacent to said surface across the width thereof; and

optical element means located between said photoreceptive surface and said array of LEDs having an end with a first surface formed to a first focal length and a second surface formed to a second focal length.

4,344,692

DEVELOPER TRANSPORTATION DEVICE FOR ELECTROSTATIC COPYING MACHINE

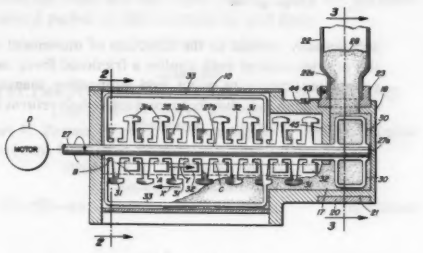
Goro Oda, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 12, 1980, Ser. No. 129,728

Claims priority, application Japan, Mar. 15, 1979, 54-32359[U]; Mar. 15, 1979, 54-32360[U]

Int. Cl.³ G03G *15/08*

U.S. Cl. 355—3 DD 9 Claims



6. In an electrostatic copying machine having an electrophotographically sensitive member, a developer supply container, a developer supply chamber for storing the developer supplied from the container and having an orifice for permitting the developer to be supplied from the chamber to within a casing, developer transportation means within the casing for transporting the developer from the container through the supply chamber and into the casing, and developer transfer means for transferring developer from the casing to the electrophotographically sensitive member, the improvement wherein said developer transportation means comprises:

(a) a substantially horizontal rotary shaft,

(b) driving means for rotating said shaft,

(c) first blade means mounted on said shaft for contacting said developer at a first zone spaced from said shaft and transporting the developer horizontally through said first zone in a first direction substantially throughout the length of said shaft,

(d) second blade means mounted on said shaft for contacting said developer at a second zone at a lesser distance from said shaft than said first zone and transporting the developer horizontally through said second zone in a second direction contrary to said first direction substantially throughout the length of said shaft, whereby said developer is transported, agitated and evenly distributed such that it is substantially leveled by being moved in diverse horizontal directions throughout said first and second zones by said first and second blade means.

4,344,693

BELT TRACKING SYSTEM

Ralph A. Hamaker, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 14, 1980, Ser. No. 140,342

Int. Cl.³ G03G *15/04*

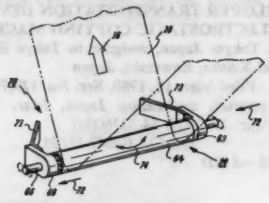
U.S. Cl. 355—3 BE 6 Claims

1. An electrophotographic printing machine of the type having a photoconductive belt arranged to move in a predetermined path through a plurality of processing stations disposed therealong, wherein the improvement includes:

means for supporting the photoconductive belt, said supporting means being frictionally driven by the photoconductive belt to move in unison therewith in at least a

direction substantially normal to the direction of movement along the pre-determined path; and

means for pivotably holding said supporting means so that movement of the photoconductive belt in the direction



substantially normal to the direction of movement along the pre-determined path applies a frictional force on said supporting means to pivot said supporting means in a direction such that the photoconductive belt returns to the pre-determined path of movement.

4,344,694

DEVELOPING EQUIPMENT FOR AN ELECTROPHOTOGRAPHIC COPYING DEVICE

Gerhard Ruh, Wilhelmshaven, Fed. Rep. of Germany, assignor to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

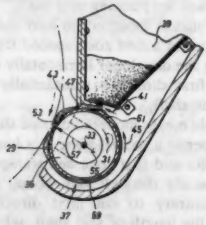
PCT No. PCT/DE79/00025, § 371 Date Nov. 2, 1979, § 102(e) Date Nov. 2, 1979, PCT Pub. No. WO79/00708, PCT Pub. Date Sep. 20, 1979

PCT Filed Mar. 2, 1979, Ser. No. 173,200

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1978, 2809353

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 DD **4 Claims**



1. Developing apparatus for an electrophotographic copier which includes

an intermediate image carrier;

a developer drum comprising a rotatably mounted magnetic arrangement and a nonmagnetic electrically conductive hollow cylinder fixedly surrounding said magnetic arrangement; and

means for applying at a dosaging gap a magnetic brush of magnetic developer particles onto the electrically conductive surface of said hollow cylinder, the transfer of said developer particles from the magnetic brush onto said intermediate image carrier being effected by the electric field originating from the latent image,

wherein said nonmagnetic hollow cylinder has a reduced wall thickness adjacent said intermediate image carrier, said reduced wall thickness being formed of a flattened portion at the outer circumference of the hollow cylinder adjacent said intermediate image carrier.

4,344,695

METHOD AND APPARATUS FOR SLITWISE EXPOSURE OF PHOTOSENSITIVE MEMBER IN COPYING MACHINES

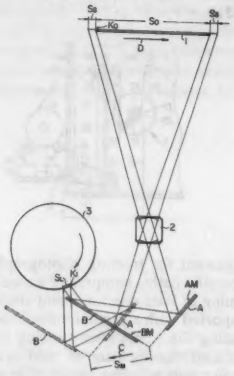
Toyokazu Satomi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 23, 1980, Ser. No. 143,005

Claims priority, application Japan, Apr. 25, 1979, 54/051186

Int. Cl.³ G03G *15/28*; G03B *27/32*

U.S. Cl. 355—8 **21 Claims**



1. A method of slitwise exposure for a photosensitive member in copying machines comprising the steps of placing an original to be copied at a given position in planar form, disposing a focusing lens at a given location and in a given orientation so as to correspond to a full effective copying region of an original receptable, disposing a pair of rectangular reflecting mirrors on the image side of the focusing lens with their specular surfaces disposed at locations and orientations such that part of the exposing light flux from the focusing lens is successively reflected by the reflecting mirrors to focus a light image of the original on a photosensitive member, and moving the reflecting mirrors in different given directions while moving the surface of the photosensitive member in a direction at a uniform rate, thus effecting a slitwise exposure of the photosensitive member, in which the directions in which the pair of reflecting mirrors are moved are chosen so as to reduce the width of the specular surfaces of the reflecting mirrors, said mirrors being disposed at an obtuse angle relative one another.

4,344,696

MEANS FOR DRIVING RECIPROCATING MEMBERS

Tomoji Murata; Yasuo Goto, both of Toyokawa, and Masamichi Hayashi, Aichi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 8, 1980, Ser. No. 176,636

Claims priority, application Japan, Aug. 10, 1979, 54-102468

Int. Cl.³ G03G *15/28, 15/32*

U.S. Cl. 355—8 **8 Claims**

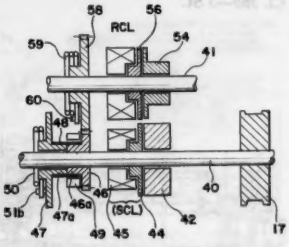
1. Means for driving reciprocating members, which is for use in alternate drives for scanning and return movements of at least one movable member of an electrophotographic copying machine of the scanning exposure type, thereby to cause an original to be scanned, comprising:

clutching means to selectively transmit and interrupt alternate drives, thereby to cause said movable member to be electrically driven for said scanning and return movements, said clutching means including a first clutch member mounted on a first shaft for said return movement and a second clutch member mounted on a second shaft for said scanning movement;

a return gear mounted on said first shaft and a scan gear

mounted on said second shaft, both being meshed with each other;

resilient means for causing said movable member to have a predetermined initial velocity for said return movement subsequent to arrival at an end position of scanning through the resilient energy stored thereby, said resilient means being substantially mounted on said second shaft so that it can function in association with the rotation of said second shaft; and



electric circuit means for sequentially controlling said scanning and return movements of said movable member therewith;

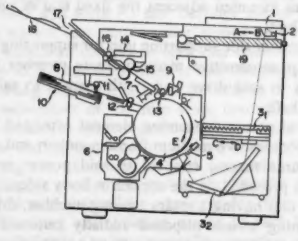
wherein an actuation for said return movement of said movable member is adjustable to correspond to a lengthwise dimension of said original with said clutching means in cooperation with said electric circuit means.

4,344,697

COPYING MACHINE

Hiroshi Matsumoto, Yokohama, and Tomoki Ogura, Ayase, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 8, 1981, Ser. No. 252,193
Claims priority, application Japan, Apr. 11, 1980, 55-47790
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 C **6 Claims**



1. A copying machine capable of being set to a normal mode, a multiple copy mode and an interrupt copy mode, comprising:

(A) a power supply;

(B) data input means including

(a) a pause button for coupling information for switching the multiple copy mode over to the interrupt copy mode,

(b) a print button for coupling information for starting the copying, and

(c) digital keys for coupling the data of the quantity of copies;

(C) display means for displaying the preset quantity of copies and the quantity of copies produced; and

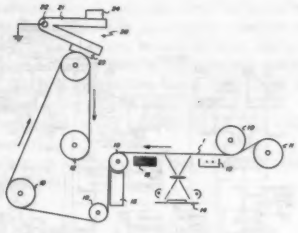
(D) control means including storing means for storing data from said data input means and information displayed on said display means and a timer for counting a predetermined period of time, said control means functioning to store the information displayed on said display means in said storing means while supplying a start signal to said timer for starting the counting thereof in response to interrupt copy mode information coupled from said pause button in the multiple copy mode, read out the information stored in said storing means at the time of the multiple copy mode and display the read-out information on said display means to thereby resume the multiple copy mode if no data is coupled from said data input means during said predetermined period of time counted by said timer, supply the start signal to said timer for starting the counting of said timer, and setting the normal mode if the multiple copy mode is not established or no information is coupled from said data input means during the predetermined period of time counted by said timer.

4,344,698

ELECTROPHOTOGRAPHIC APPARATUS HAVING IMPROVED GROUNDING MEANS

Robert E. Zeman, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 1, 1980, Ser. No. 192,769
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—16 **10 Claims**



1. In electrophotographic apparatus of the type having means for feeding an imaging element, including an incisable photoconductive layer overlying a conductive layer on an insulative support, along an operative path for charging, exposure and development, an improved device for electrically coupling the conductive layer of such element to a reference potential, said device being particularly suitable for single-use, web or film type imaging elements and comprising:

(a) electrically-conductive means located along said path for incising, along an edge portion of the imaging element fed thereby, into the conductive layer of such element; and

(b) means for electrically connecting said electrically-conductive means to such reference potential.

4,344,699

EXPOSURE AND CONTRAST DETERMINATION BY PRESCANNING IN ELECTRONIC PHOTOPRINTING SYSTEMS

Walter L. McIntosh, Woodbridge, Va., assignor to Log Etronics, Inc., Springfield, Va.

Filed Jun. 5, 1981, Ser. No. 270,758
Int. Cl.³ G03B *27/16, 27/80*
U.S. Cl. 355—20 **30 Claims**

1. Automatic contrast and density control means for a scanning photographic printer that uses a beamed spot of radiant energy to expose an image receiving media from an image carrying media, said control means comprising:

a. circuit means for providing a prescan of the image carrying media by said beamed spot of energy before the exposure of said image receiving media;

b. photosensor means for measuring a portion of the radiant

energy that is modulated by the image carrying media to generate a density-related signal;

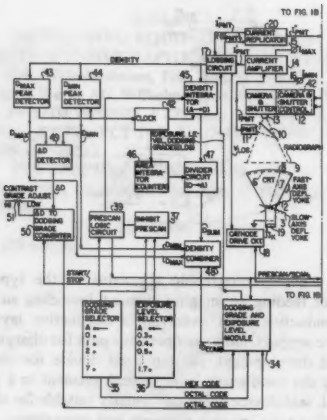
c. circuit means for establishing a D_{min} signal representative of the minimum density of said image carrying media, a D_{max} signal representative of the maximum density of the image carrying media, a ΔD signal representative of the difference between D_{min} and D_{max} and a D_{sum} signal representative of the sum of the densities sampled during the prescan;

d. comparative circuit means for automatically comparing the ΔD signal to a preset value representative of the contrast range of the image receiving media and generating a contrast excursion range signal;

e. control means for modulating said beamed spot of radiant energy, said control means responsive to said D_{sum} density level signal and said contrast range excursion signal to set the exposure level and contrast excursion range applied to said image receiving media during the exposure of the image recording media.

27. A contact printer with automatic exposure control, said printer comprising:

a. a light source, said light source having a pre-exposure measuring mode and an exposure mode;



b. means for supporting an image receiving material and an image carrying material in intimate emulsion to emulsion contact, with said image carrying material placed between said light source and said image receiving material;

c. photo sensor means for measuring the light modulated by said image carrying media during the pre-exposure mode and control means to adjust the intensity or duration of said light source during the exposure mode;

d. a pair of identical filters with opposing movement, said first filter being positioned between said light source and said image receiving material to attenuate said light during the pre-exposure measuring mode, and positioned out of light path when said light source is in its exposure mode; said second filter being mounted between said image receiving media and said light sensor means to attenuate the light falling on said sensor during the exposure mode, and out of the light path during the pre-exposure measuring mode; whereby only the first of said filters attenuates the light between said light source and said photosensor during the pre-exposure measuring mode, and only the second of said filters attenuates the light between said light and said photosensor during the exposure mode.

4,344,700

MECHANISM FOR MOUNTING AND DISMOUNTING A SCREEN-LIKE PHOTOSENSITIVE MEDIUM

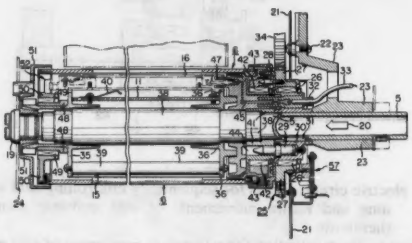
Nobuhiro Kasama, and Tadayuki Kitajima, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1979, Ser. No. 98,762

Claims priority, application Japan, Dec. 8, 1978, 53-151763; Dec. 8, 1978, 53-151766

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 SC **5 Claims**



1. A construction for enabling a screen-like photosensitive medium, having a number of fine passage openings, to be removably mounted with respect to an apparatus body, comprising:

a photosensitive medium frame member for supporting said photosensitive medium in the form of a drum;

a rotary center shaft for providing the center of rotation of said photosensitive medium frame member, said shaft being rotatably fixed at one end to the apparatus body;

a drive unit mounted adjacent the fixed end of said rotary center shaft;

a frame member side supporting unit for supporting that side of said photosensitive medium frame member which is adjacent to said drive unit, with respect to said rotary center shaft;

an electrical power consuming element provided inside of said photosensitive medium frame member; and

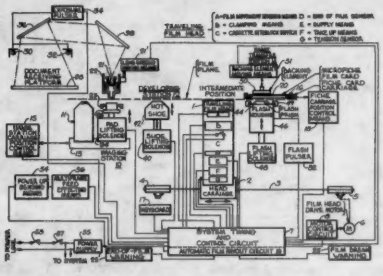
power source means, coupled to said power consuming element, provided on the apparatus body side;

said drive unit having a rotary bearing member, drive force transmitting means disposed radially outward of said rotary bearing member, and a fixed portion for carrying electrical wiring inside of the bearing member, said fixed portion being fixed on said rotary center shaft, said frame member side supporting unit having, outside of the rotary bearing member, a portion for supporting said photosensitive medium frame member and having a fixed portion for carrying electrical wiring disposed inside of said bearing member, said latter fixed portion lying on said rotary center shaft and being slidable relative to said center shaft, said electrical wiring on said drive unit side and said electrical wiring on said side supporting unit side having removable contacts, whereby when said photosensitive medium supporting member is mounted or dismounted with respect to the apparatus body, said power source portion on the body side and said power consuming portion on said supporting member side are connected or disconnected by said contacts.

4,344,701
MICROFICHE RECORDING SYSTEM WITH TRAVELING FILM HEAD

Peter H. Klose, Troy, and Herbert C. Ovshinsky, Oak Park, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Jan. 23, 1981, Ser. No. 227,957
Int. Cl.³ G03B 27/44
U.S. Cl. 355—51 26 Claims



1. In a microfiche film recording system including movable supporting means for supporting an intermediate film strip, film advancing means for advancing a selected area of said film strip into an imaging position thereon, carriage means for moving said supporting means between an imaging station where said selected area of said film strip is exposed and an image transfer station where said image on said selected area is transferred to a microfiche photographic film having frames upon which said image is to be transferred, means for controllably positioning said microfiche photographic film with respect to the selected imaged area of the intermediate film strip, means for transferring said image to a selected frame of said microfiche film, and at least one pressure-applying means which engages with said intermediate film to create tension stresses therein potentially capable of inducing erratic shifting of said film strip and which can cause registration errors in the image transfer to said microfiche photographic film, the improvement comprising film strip holding means movable with said film strip supporting means as said supporting means is moved back and forth by said carriage means between said imaging station and said transfer station and having a film holding condition causing at least one lateral margin of said film strip to be fixed in position at said imaging position and a film releasing condition position, permitting or causing longitudinal movement of the film strip, control means for said holding means for operating said holding means in said holding condition during the exposure of said intermediate film strip and during the movement of said supporting means to said image transfer station and during the transfer of said image thereon to said microfiche photographic film, said control means operating said holding means to said film releasing condition following an image transfer operation, and means for operating said film advancing means for advancing a new unexposed area of said intermediate film to said imaging position during the operation of said holding means in said film releasing condition so that a new area is in position for imaging prior to the next operation of said holding means to said holding condition.

4,344,702
ADAPTER FOR PHOTOGRAPHIC ENLARGER AND METHOD OF ATTACHING SAME

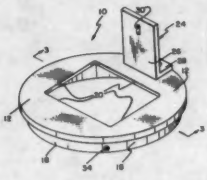
Robert M. Holland, P.O. Box 12364, Wichita, Kans. 67277

Filed Sep. 2, 1980, Ser. No. 183,249
Int. Cl.³ G03B 27/54, 27/32
U.S. Cl. 355—67 7 Claims

1. An adapter for fitting an Omega C-700 color head to an Omega D type black and white condenser-enlarger comprising a circular plate member with a top and bottom and having a recess with a recess wall along its circumference such that the periphery of the top of said plate defines a flange, said plate member including a structure defining a generally rectangular aperture and a substantially circular recess in said bottom; and a generally L-shaped bracket member including a face and a base, said base of said bracket member being mounted on top of said plate in proximity to said periphery.

7. A process for equipping an Omega D type black and white enlarger having an upper lamphouse to receive and mount an Omega C-700 color head comprising:

(a) attaching an adapter to said color head, said adapter



comprising a circular plate member with a top and a bottom and having a recess with a recess wall along its circumference such that the periphery of the top of said plate defines a flange, said plate member including a structure defining a generally rectangular aperture and a substantially circular recess in said bottom, and a generally L-shaped bracket member including a face and a base, said base of said bracket member being mounted on top of said plate in proximity to said periphery;

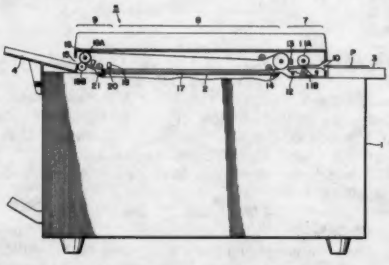
(b) removing said upper lamphouse of said enlarger and subsequently,

(c) installing on said enlarger said attached adapter-color head of step (a).

4,344,703
COPYING MACHINE WITH RETRACTABLE STOPPER

Takao Nezu, Hamura, and Yasuo Turubuchi, Kiyose, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1980, Ser. No. 210,000
Claims priority, application Japan, Nov. 27, 1979, 54-164032
Int. Cl.³ B65H 9/04
U.S. Cl. 355—76 7 Claims



1. In a copying machine comprising a copy board having an exposure section, and a document feeding apparatus overlying the copy board for supplying the original to be copied on the exposure section and for discharging the original after the exposure is completed, the improvement characterized in that a retractable stopper device including at least one stopper portion which is normally projected is provided on the copy board at an original discharge side of the exposure section in the copying machine, and means mounted on the document

feeding apparatus and engageable with the stopper device whereby the stopper device is retracted forcibly after the exposure is completed.

4,344,704

METHOD OF DETERMINING CORRECTION PARAMETERS FOR USE IN LIGHT-AMOUNT ADJUSTMENT IN A COLOR COPYING OPERATION

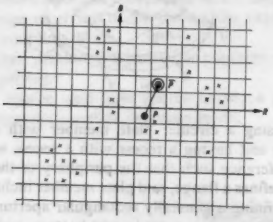
Siegfried Thurm, Voiswinkel, and Konrad Bunge, Cologne, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 19, 1980, Ser. No. 160,974

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1979, 2925264

Int. Cl.³ G03B *27/32*

U.S. Cl. 355—77 **13 Claims**



1. A method of determining a correction parameter for the copying of a colored original, comprising the steps of sensing a characteristic of each of the three primary colors in a plurality of regions of said colored original; establishing a pair of values for each of said regions from the sensed characteristics of said primary colors in the respective regions; classifying said pairs of values into distribution zones which respectively correspond to the spread of said values for an image on said colored original; averaging the pairs of values within the respective distribution zones to obtain an average value for each of said distribution zones, whereby the frequency with which each of said primary colors appears on said colored original is eliminated as a factor in the determination of said correction parameter and all of the sensed color compositions have substantially the same weight in said determination; forming an overall average from said average values; and ascertaining the magnitude and sense of said correction parameter from the difference between said overall average and a like average for a calibrating original.

4,344,705

DISTANCE MEASURING APPARATUS BASED ON THE PULSE TRAVEL TIME METHOD

Günter Kompa, Schopfheim, and Don J. R. Stock, Schopfheim-Langenau, both of Fed. Rep. of Germany, assignors to Endress u. Hauser GmbH u. Co., Maulburg, Fed. Rep. of Germany

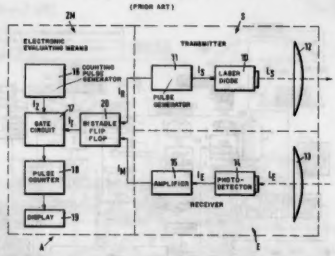
Filed Mar. 7, 1980, Ser. No. 128,174

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1981, 2908854

Int. Cl.³ G01C *3/08*; G01S *13/10*

U.S. Cl. 356—5 **20 Claims**

1. Distance measuring apparatus based on the pulse travel time method comprising a light pulse generator for generating periodic light pulses, a transmitting optical system for transmitting the light pulses, a receiving optical system for receiving the echo pulses produced by reflection of the light pulses at a target object, a photoelectric transducer for converting each echo pulse to an electrical measuring pulse, means for generating electrical reference pulses in predetermined time relationship to the transmitted light pulses, a time transformation stage operating by the sampling method and comprising a sampling pulse generator for generating periodic sampling pulses whose period is slightly different to the period of the transmitted light pulses, a first sampling circuit receiving said sampling pulses and said reference pulses and producing time-transformed reference pulses by periodically sampling a large number of successive reference pulses by means of said sampling pulses, and a second sampling circuit receiving said sampling pulses and said measuring pulses and producing time-transformed measuring pulses by periodically sampling a large number of



successive measuring pulses by means of said sampling pulses, said second sampling circuit being directly connected to the output of said photoelectric transducer to receive said measuring pulses without intervening amplification, and time measuring means for measuring the time interval between corresponding edges of each time-transformed reference pulse and an associated time-transformed measuring pulse.

4,344,706

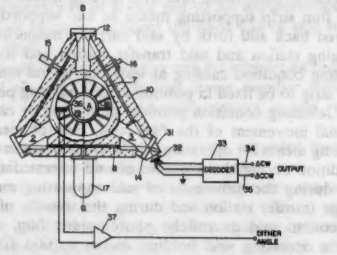
RING LASER GYRO DITHER PULSE ELIMINATOR

Bo H. G. Ljung, and George F. Schroeder, both of Wayne, N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Jul. 14, 1980, Ser. No. 168,918

Int. Cl.³ G01C *19/64*

U.S. Cl. 356—350 **10 Claims**



1. In a dithering ring laser gyro, a system for producing inertial rotation data free of dither, the system comprising:

detecting means for detecting gyro rotation in the clockwise and counterclockwise directions, the rotation including dither components;

means connected to the gyro for tracking the clockwise and counterclockwise components of dither alone;

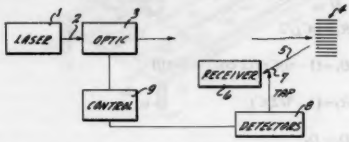
gating means connected at its input to the outputs from the detecting means and the tracking means for generating first and second signals;

counter means having a count increasing input driven by the first signal and a count decreasing input driven by the second signal for eliminating the effect of dither and accumulating a count corresponding to true inertial gyro rotation data.

4,344,707
MODAL SENSOR

Norbert A. Massie, Westlake Village, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 14, 1980, Ser. No. 149,608
Int. Cl.³ G02B 5/08
U.S. Cl. 356—354 16 Claims



1. In a system which uses a point light source or laser emitting a beam for the purposes of interaction with an object, or of transmission, an apparatus for determining unwanted wavefront distortions, comprising:

means for intercepting said beam for branching off a portion of the beam and deflecting it into a particular path which includes an axis;

means disposed for intercepting the branched-off beam and focusing the entire branched-off beam into a single particular zone along the axis;

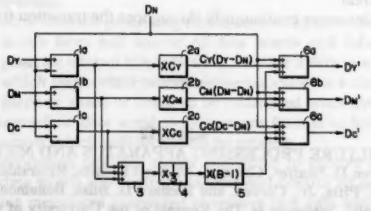
means disposed in, or in the vicinity of, the particular zone for detecting a representation of a point-spread function of the focused beam and its distribution in a particular plane transversely to the axis; and

means connected to the means for detecting, for generating signals representing moments of the spread function, those moments being representative of the value of the aberration coefficients of the unwanted wavefront distortions, including tip, tilt, focus, and both astigmatisms.

4,344,708
METHOD AND APPARATUS FOR EXPOSURE QUANTITY CONTROL IN AUTOMATIC COLOR PRINTER

Kanji Tokuda, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 807,994, Jun. 20, 1977, abandoned.
This application Jun. 17, 1981, Ser. No. 274,570
Claims priority, application Japan, Jun. 21, 1976, 51/73684
Int. Cl.³ G03B 27/72
U.S. Cl. 356—404 2 Claims



1. A method of producing a color print from a color film negative, of the type wherein exposure quantity control signals are generated in accordance with the density Dn of a reference negative and the measured color densities of each of the primary colors in light received from said color film negative, and wherein a color print is generated in accordance with said exposure quantity control signals by exposing a photographic paper to predetermined quantities of light of each of said primary colors, said predetermined quantities of light being controlled in accordance with said exposure quantity control signals, said method comprising:

measuring said color densities of said three primary colors of light received from said color film negative;

generating color signals proportional to said measured color densities of each of said primary colors;

logarithmically converting said color signals to obtain color density signals Dy, Dm and Dc;

simultaneously correcting the color densities represented by each of said color density signals and the color balance represented collectively by said color density signals in accordance with the difference between said measured color densities and said reference negative density, and independently correcting the color densities represented by each of said color density signals in accordance with the average difference between said color density signals and said reference negative density, by generating corrected color density signals Dy', Dm' and Dc' defined by:

$$Dy' = Cy(Dy-Dn)+Dn+(B-1)[-(Dy-Dn)+(Dm-Dn)+(Dc-Dn)/3],$$

$$Dm' = Cm(Dm-Dn)+Dn+(B-1)[(Dy-Dn)+(Dm-Dn)+(Dc-Dn)/3],$$

and,

$$Dc' = Cc(Dc-Dn)+Dn-(B-1)[(Dy-Dn)+(Dm-Dn)+(Dc-Dn)/3],$$

wherein Cy, Cm, Cc and B are constants and D_n is the density of a reference film negative;

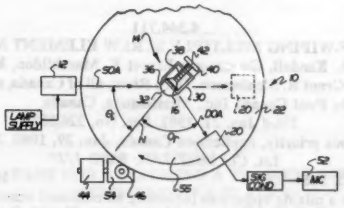
exponentially converting said corrected color density signals Dy', Dm' and Dc' of the three primary colors to obtain said exposure quantity control signals; and

exposing said photographic paper to predetermined quantities of light of each of said primary colors in accordance with said exposure quantity control signals to thereby obtain said color print.

4,344,709
METHOD AND APPARATUS FOR PHOTOGONIOMETRIC ANALYSIS OF SURFACES

Theodore Provder, Olmsted Falls; Richard M. Holsworth, Westlake, and Mark E. Koehler, Middleburg Heights, all of Ohio, assignors to SCM Corporation, Cleveland, Ohio

Filed May 8, 1980, Ser. No. 147,854
Int. Cl.³ G01N 21/55, 21/47
U.S. Cl. 356—445 9 Claims



1. A method of analyzing the specular reflectance characteristics of a test surface comprising the steps of:

illuminating said test surface with a collimated beam of light incident on said surface at a known angle,

measuring the reflectance characteristics of said test surface by measuring the intensity of light reflected from said surface at plural selected angles of reflectance,

providing a mathematical equation relating reflectance intensity to reflectance angle for a standard surface whose reflectance characteristic substantially lacks a spectral peak, and

analyzing the difference between reflectance characteris-

tics of said test surface and said mathematical equation, said difference representing the spectral reflectance characteristic of said surface.

4,344,710

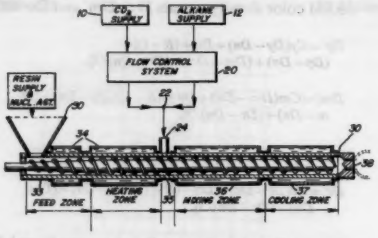
POLYMER FOAM EXTRUSION SYSTEM

D. Emil Johnson, Canandaigua; Charles M. Krutchen, Pittsford, and G. Vincent Sharps, Jr., Fairport, all of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 158,187, Jun. 10, 1980, abandoned. This application Nov. 10, 1980, Ser. No. 205,353

Int. Cl.³ B29B *3/00, 5/02, 1/06*

U.S. Cl. 366—76 **5 Claims**



1. A system for producing foamable thermoplastic resin mixture comprising:

extruder means for transporting resin under pressure from a feed point to a discharge point through a heating zone, fluid injection zone and mixing zone;

resin supply means for introducing resin to the extruder means at the feed point for melting in the heating zone;

storage means for maintaining a plurality of diverse volatile liquids under the autogeneous pressure of the material, at least one of said volatile liquids being normally gaseous;

fluid handling means for pressurizing said iquids from said storage means to the fluid injection zone of the extruder means;

heat exchange means operatively connected between said storage means and said fluid handling means for cooling the normally-gaseous material to prevent flashing thereof during pumping; and

flow metering means operatively connected with the fluid handling means for supplying predetermined amounts of the diverse volatile liquids.

4,344,711

SELF-WIPING MULTIPLE SCREW ELEMENT MIXER

John A. Kendall, Gananoque; Ernest K. Marchildon, Kingston, and Grant R. Stephenson, Deep River, all of Canada, assignors to Du Pont Canada Inc., Mississauga, Canada

Filed Jan. 21, 1981, Ser. No. 226,883

Claims priority, application Canada, Jan. 29, 1980, 344594

Int. Cl.³ B01F *7/24;* **B29B** *1/10*

U.S. Cl. 366—83 **16 Claims**

1. In a mixing apparatus including an enclosed vessel having an interior surface throughout its length in the shape of at least two intersecting conical frustums with axes parallel and substantially vertical, the base of the frustums being displaced upward with respect to the apexes, at least two interengaging helical screw elements having multilobal cross-sections and rotatably supported on shafts passing through seals in the base of the vessel, the number of frustums and the number of screw elements being equal, the screw elements when co-rotated conforming to the interior surface of the vessel such that the screw elements effect a complete wiping of the interior surface, and wherein the screw elements interengage uninterruptedly along their lengths such that each element effects a complete wiping of the adjacent element, the bottom portion of the screw elements forming within the vessel a pressure generating zone and the top portion of the screw elements forming a mixing zone having a hollow center described by the co-rotating screw elements, the mixing zone extending above the vessel's liquid level, the improvement comprising:

a continuous rounded-tip transition from a multilobal cross-section to a circular cross-section in each of the screw elements in the mixing zone, the cross-sections throughout the transitions being defined by the equations:

$$R_t=\eta C_L/2$$

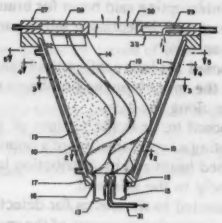
$$D_t=(1-\eta)C_L/(2\cos(\pi/(2n)))$$

$$R_f=(1-\eta/2)C_L$$

$$D_f=D_t$$

$$\alpha=\pi/n$$

wherein



R_t is the tip arc radius of each tip,

η is a "degree of tip rounding" parameter,

C_L is the distance between adjacent parallel axes of the conical frustums (and of the centroids of the cross-sections of the screw elements),

D_t is the distance measured along the tip arc bisector to the tip arc center from the centroid of the cross-section,

n is the number of tips of the multilobal cross-section and is an odd number in the range of 3 to 9,

R_f is the radius of the flank arcs which connect adjacent tip arc radii,

D_f is the distance measured along the flank arc bisector to the flank arc center from the centroid of the cross-section,

α is the angle subtended by each tip arc and by each flank arc, and

wherein

η increases continuously throughout the transition from 0 to 1.

4,344,712

CULTURE PROCESSING APPARATUS AND METHOD

Steven D. Shaffer, Chino; L. Michael Kienitz, Riverside; James N. Pitts, Jr., Corona, and Richard D. Bliss, Beaumont, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Aug. 25, 1980, Ser. No. 181,074

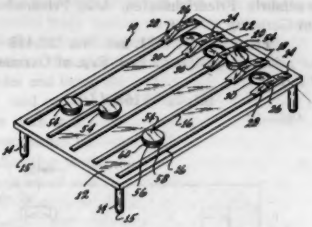
Int. Cl.³ B01F *11/00*

U.S. Cl. 366—108 **12 Claims**

1. Apparatus for providing a solid layer of substantially uniform thickness from liquid material in a covered vessel comprising:

a vibrator member for placing a vessel having a movable cover and containing liquid material for forming a solid layer of substantially uniform thickness, in contact therewith; and

means connected with said vibrator member for lifting the cover of said vessel during placement of said vessel in



contact with said vibrator member, to permit vibration of the vessel in a substantially vertical direction.

4,344,713

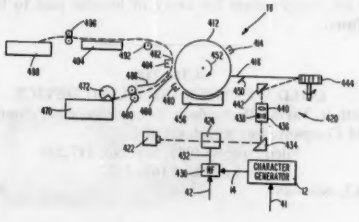
CHARACTER OVERPRINTING METHOD AND APPARATUS IN NON-IMPACT PRINTERS

James H. Cullen, Bensalem, Pa., assignor to Sperry Corporation, New York, N.Y.

Filed Jul. 9, 1980, Ser. No. 167,071

Int. Cl.³ B41G *3/00*

U.S. Cl. 400—22 **5 Claims**



1. A system, to be used with a non-impact printer and a source of data words, to effect overprinting comprising, in combination:

control bit code generating means connected to receive data words from said source of data words and formed to generate control bits indicating whether a data word with which said control bits would be associated is a character shape or space or needs to be underlined when printed;

intermediate data word storage means formed to hold data words which will ultimately be printed;

overprinting circuitry means connected to receive second data words and control bits from said control bit generating means and connected to receive first data words and control bits from said intermediate data word storage means to compare said first and second data words and associated control bits to effect a selective merger of said data words and a selected modification of said control bits, and, further, connected to transmit said merged data words and modified control bits back to said intermediate data word storage means whereby certain data words from said second data words may replace certain data words from said first data words and whereby certain modified control bits cause certain data words to be underlined when printed.

4,344,714

DEVICE FOR POSITIONING THE BEGINNING OF A LINE IN A TYPEWRITER

Raymond Clavel, Yverdon, Switzerland, assignor to Hermes Precisa International S.A., Yverdon, Switzerland

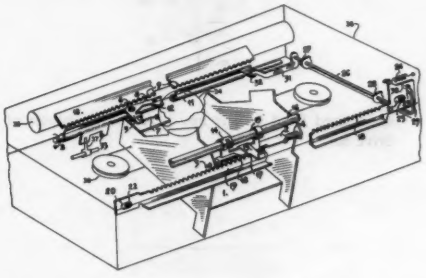
PCT No. PCT/CH79/00017, § 371 Date Oct. 7, 1979, § 102(e) Date Sep. 7, 1979, PCT Pub. No. W079/00599, PCT Pub. Date Aug. 23, 1979

PCT Filed Feb. 6, 1979, Ser. No. 165,130

Claims priority, application Switzerland, Feb. 7, 1978, 1326/78

Int. Cl.³ B41J *19/66*

U.S. Cl. 400—334.3 **3 Claims**



1. Device for positioning the beginning of the line in a typewriter provided with a typing ball carried by a carriage (1) moving parallel to a platen, including at least a margin stop (13) forming a stop for the carriage (1) and capable of being fixed in position in relation to a margin rack (19) to define the beginning of the lines of writing, said margin rack (19) being mounted on a pair of shafts (22,23) and sliding against the action of an elastic element (24) in a direction parallel to that of the movement of the carriage (1), an escapement pawl being carried by the carriage (1) and engageable with a rack bar (10) which is fixed, means holding the pawl (5) in a disengaged position relative to the rack bar (10) during the return of the carriage (1) to the beginning of the line, characterized by the fact that the margin rack (19) engages with means for locking (11,26,29,31,32) the pawl (5) in a disengaged position relative to the rack bar during the movement of said margin rack (19).

4,344,715

MEANS FOR ATTACHING A TRACTOR DRIVE ASSEMBLY TO A PLATEN

Arthur C. Van Horne, Santa Clara, and Russel E. Yarp, Sunnyvale, both of Calif., assignors to Dataproducts Corporation, Woodland Hills, Calif.

Filed Mar. 3, 1980, Ser. No. 126,651

Int. Cl.³ B41J *15/00*

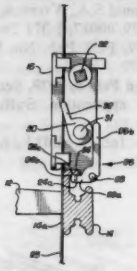
U.S. Cl. 400—616.1 **12 Claims**

1. In a printer or the like having a stationary platen and utilizing a tractor-type incremental paper drive system driven by a rotating drive bar, a system for achieving high accuracy incremental paper motion comprising:

a tractor drive assembly for moving paper across said platen; and

means connected to the tractor drive assembly for locking

said tractor drive assembly directly to said platen, whereby the position of the tractor drive assembly is



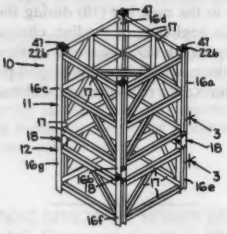
maintained fixed despite any lack of straightness of the drive bar.

4,344,716

BEAM JOINING APPARATUS

Jacob Sigal, Cedar Rapids, Iowa, assignor to FMC Corporation, Chicago, Ill.

Filed Dec. 8, 1980, Ser. No. 214,158
Int. Cl.³ F16D 1/02
U.S. Cl. 403—13 10 Claims



1. Apparatus for joining a pair of flanged beams in an end-to-end relationship comprising:

a pair of end plates each having a pair of semi-circular notches therein;

means for connecting each of said end plates to an end of a corresponding one of said beams;

a pair of semicylindrical clamps each having a groove which mates with said notches in said pair of end plates, said clamps each having radial flanges on either side of said groove; and

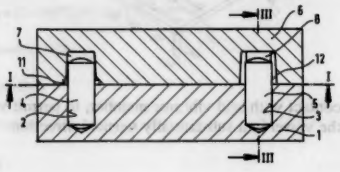
means for securing one of each of said pair of semicylindrical clamps to the other of said pair of semicylindrical clamps with said groove of one of each of said pair of semicylindrical clamps in one of each of said notches of said pair of juxtaposed end plates with the outer edges of said flanges pressing against the outer edges of said end plates and with said radial flanges clamping said pair of end plates in a secure connection.

4,344,717

MEANS FOR MUTUAL POSITIONING OF MEMBERS

Johann Merz, Bopfingen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

Filed May 1, 1981, Ser. No. 259,418
Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018651
Int. Cl.³ F16B 17/00
U.S. Cl. 403—14 5 Claims



1. Means for positioning a pair of members relative to each other wherein said members have reamed bores to receive locator pins to extend therebetween and having an elongated bore to compensate for misalignment of said members when being positioned;

the improvement which comprises:

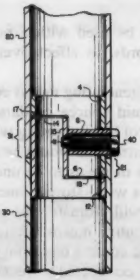
one of said members having die cast therein a box-like bore having a plurality of sides configured to receive an end of a locator pin the other end of which is to be received in a reamed bore, said box-like bore being tapered and having open corners to receive metal extruded as a locator pin is force fitted thereinto, and the elongated bore being likewise die cast, both said latter bores being tapered to provide ready access for entry of locator pins to be force fitted.

4,344,718

COLD WEATHER COUPLING DEVICE

Kenneth R. Taylor, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 2, 1981, Ser. No. 317,215
Int. Cl.³ F16D 1/02
U.S. Cl. 403—287 3 Claims



1. A cold weather coupling device for quick joining of two shafts in an end-to-end abutting relation comprising a first coupling means adapted to be carried by a first shaft end and comprising a first hollow cylindrical body having an arcuate cut out portion of said first body removed from a part but not all of the length of said first body and from the outer end of said first body, said outer end being the end furthest removed from said first shaft, an aperture in said first cylindrical body opposite said cut out portion, a hollow, internally threaded stud means which is open at both ends and which has one end

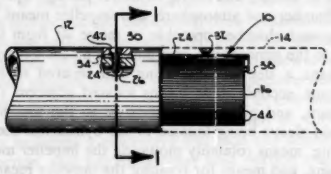
fixed to said first body in registry with said aperture in said first body and extending into the interior of said first body until it reaches said cut out portion, a second coupling means adapted to be carried by a second shaft end and comprising a second hollow cylindrical body having an arcuate cut out portion of said second body removed from a part but not all of the length of said second body and from the outer end of said second body, said outer end being the end furthest removed from said second shaft, said cut out portion of said second body being sized to mate with said cut out portion of said first body to provide a continuous cylindrical body extending from one shaft end to the other shaft end, a plate means extending across the cut out portion of said second body, said plate means having an aperture therein, said plate aperture being located in said plate so that when said first and second bodies are mated to form said continuous body said plate aperture is in registry with the interior open end of said stud means so that a threaded pin means can be screwed into said stud means from outside said first body and said pin means will extend through said stud means and into said plate aperture thereby physically joining said first and second bodies and said first and second shafts to one another.

4,344,719

INTERNALLY EXPANDING RAILING COUPLING

Wenzel W. Thom, Wichita, Kans., assignor to Architectural Art Mfg., Inc., Wichita, Kans.

Filed Jul. 24, 1980, Ser. No. 171,708
Int. Cl.³ F16D *1/00*
U.S. Cl. 403—297 **7 Claims**



1. An internal expanding coupling for tubular pipe railing comprising:

a pair of tubular rail sections abutted end-to-end, each including a lateral opening spaced inwardly from the ends thereof;

coupling means comprising a sleeve member inserted in the ends of each rail section, a longitudinal slot extending the length of the sleeve member, a pair of camming surfaces on said sleeve adjacent the slot converging toward and terminating in the outer diameter of the sleeve;

wedge means having threaded openings therein positioned between said camming surfaces for spreading the sleeve member and locking the sleeve member and pipe sections together; and

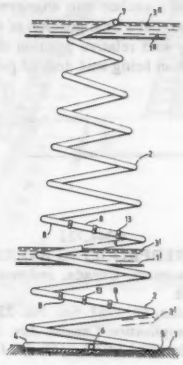
screw fastening means passing through said lateral openings in each rail section and engageable with the threaded openings in the wedge means to draw the wedge means and pipe sections together creating a rigid joint.

4,344,720

DECANTS OF TAILINGS DAMS

David D. A. Piesold, Warwick House, 25 Buckingham Palace Rd., London SW1W OPP, England

Filed Jun. 19, 1980, Ser. No. 160,893
Claims priority, application United Kingdom, Jul. 4, 1979, 7923211
Int. Cl.³ E02B *11/00*
U.S. Cl. 405—41 **8 Claims**



1. A decant for a tailings dam, comprising:

a heavy duty coiled pipe having a bottom and a top, said pipe having a water inlet at an upper end thereof;

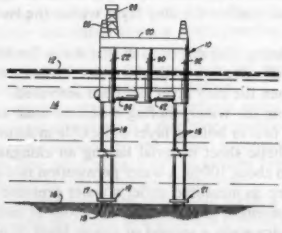
a water outlet duct extending laterally from said bottom of said coiled pipe out of said dam, said coiled pipe comprising a plurality of turns axially spaced apart one above the other, said turns being large and so sized in relation to the cross-section area and wall thickness of said pipe from which said turns are formed that, in use of said dam, said coil is compressed axially as tailings deposited in said dam are consolidated around said decant without said pipe being overstressed by said axial compression.

4,344,721

MULTIPLE ANCHORS FOR A TENSION LEG PLATFORM

Riley G. Goldsmith, Houston, Tex., assignor to Conoco Inc., Ponca City, Okla.

Filed Aug. 4, 1980, Ser. No. 175,103
Int. Cl.³ B63B *35/44*; E02B *17/00*
U.S. Cl. 405—224 **43 Claims**



1. A method of installing an underwater anchor assembly, said method comprising the steps of:

lowering a primary anchor to a floor of a body of water;

ascertaining a final position of said primary anchor upon said floor, said position including at least one of a lateral location upon said floor and an angular orientation about a vertical axis;

comparing said ascertained position of said primary anchor to a desired position of a main anchor;

adjusting a relative position determining means, for determining a position of said main anchor relative to said primary anchor upon engagement of said main anchor with said primary anchor, and thereby correcting as necessary for any difference between said ascertained position of said primary anchor and said desired position of said main anchor; and

lowering said main anchor into engagement with said primary anchor so that a final position of said main anchor is determined by said relative position determining means, said final position being said desired position of said main anchor.

4,344,722

WATERPROOFING BARRIER

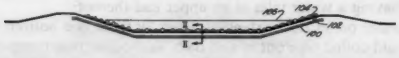
Jules M. Blais, Rosemere, Canada, assignor to Bemalux Inc., Montreal, Canada

Filed Jan. 19, 1981, Ser. No. 226,409

Claims priority, application Canada, Jan. 13, 1981, 368420

Int. Cl.³ E02D 3/12, 3/14

U.S. Cl. 405—270 36 Claims



1. A method of constructing a waterproof surface adapted to be substantially impermeable to leaching of chemicals comprising

providing a length of flexible moisture-permeable, thin, synthetic sheet material having an elongation of between 20% to about 100%, a water permeation rate of between 5 and 200 ml./sq.cm./sec. as measured under a water pressure of 35 cm., and a tensile strength of at least 200 Newtons as measured is a substantially dry state;

placing in substantial contact with said surface a first or bottom layer of the material;

forming a second or center layer of expandable Montmorillonite clay by water on top of said first layer so as to substantially cover said first layer or flexible material with the clay;

and placing a third or top layer of the flexible fabric in juxtaposition with said clay layer so as to substantially cover and confine the clay layer within the two layers of fabric;

the fabric being characterized in that it is a flexible material capable of adhesion with the outer surfaces of the clay layer when the clay layer has been activated.

20. A system for waterproofing a desired area, said system comprising a first or bottom layer of flexible moisture-permeable thin synthetic sheet material having an elongation of between 20% to about 100%, a water permeation rate of 5 to 500 ml./sq.cm./sec. as measured under a water pressure of 35 cm., and a tensile strength of at least 200 Newtons as measured in a substantially dry state; a second or center layer of expandable montmorillonite clay actuatable in water lying on top of said first layer and substantially covering the first layer of flexible material; and a third or top layer of the flexible material in juxtaposition with the clay layer substantially covering the clay layer and confining the clay layer within the two layers of fabric, the fabric being characterized as being one capable of adhesion with the clay when the clay is activated.

4,344,723

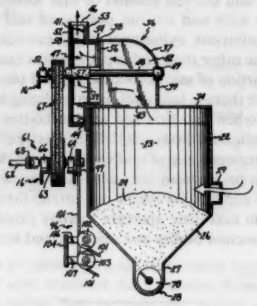
VACUUM GRAIN MOVING APPARATUS

Hartley Ellingson, Wahpeton, N. Dak., assignor to Frontier, Inc., Wahpeton, N. Dak.

Filed Feb. 25, 1980, Ser. No. 124,462

Int. Cl.³ B65G 53/60, 53/58

U.S. Cl. 406—53 33 Claims



21. An apparatus for moving particulate material, such as grain, comprising: tank means having a first chamber for accommodating particulate material, first means having a first passage for carrying air and particulate material from the source of particulate material to the first chamber, second means cooperating with the tank means for removing particulate material from said first chamber, air moving means operable to evacuate air from the first chamber of the tank means to establish a vacuum pressure in said first chamber whereby air and particulate material move through the first passage of the first means to carry particulate material to the first chamber, said air moving means including a housing defining a second chamber having a cylindrical section, an inlet passage open to the first and second chambers, an outlet passage open to the second chamber and atmosphere, and impeller means located in said second chamber operable to move air from the first chamber to the atmosphere, said impeller means having a first blade means, a sleeve surrounding and secured to the first blade means, second blade means located adjacent the first blade means, and plate means secured to the second blade means, said sleeve being located in the cylindrical section of the housing, means rotatably mounting the impeller means on said housing, and means for rotating the impeller means.

4,344,724

CUTTING TOOL ASSEMBLY

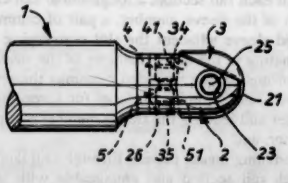
Dieter Kress, Aalen, and Friedrich Häberle, Lauchheim, both of Fed. Rep. of Germany, assignors to MAPAL Fabrik für Prazisionswerkzeuge Dr. Kress KG, Aalen, Fed. Rep. of Germany

Filed Oct. 6, 1980, Ser. No. 194,431

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1979, 2941179

Int. Cl.³ B26D 1/14; B23B 29/02, 27/08, 27/16

U.S. Cl. 407—36 7 Claims



1. A cutting tool assembly comprising: a cutter head including a pair of jaws defining a slot therebetween; a knife plate

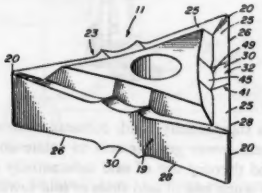
defining a pair of axially symmetrical cutting edges exchangeably mounted on said cutter head in said slot between said jaws; setscrew means adjustably connecting said knife plate on said cutter head; a pair of support members arranged at the base of said slot between said knife plate and said cutter head, said support members acting as abutment means for said knife plate; and bolt means having oppositely threaded portions engaging said support members, respectively, and cooperating with said setscrew means to enable adjustment of said knife plate.

4,344,725

CUTTING INSERT

Heinz H. Seidel, Troy, Mich., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jul. 7, 1980, Ser. No. 166,728
Int. Cl.³ B26D *1/00*
U.S. Cl. 407—114 **2 Claims**



1. A cutting insert comprising a polygonal body having substantially parallel surfaces and peripheral side surfaces substantially normal to said parallel surfaces joining to form corners of said parallel surfaces joining to form corners of said polygon at least one of said parallel surfaces having grooved recesses merging at and descending from respective corners of said polygon adjacent respective peripheral side surfaces, inner land portions extending downwardly and outwardly from a respective parallel surface toward a respective side surface, each inner land portion comprising a pair of end face portions joining an intermediate face portion, each of said grooved recesses including a respective end face and adjoining outer land portion, said adjoining outer land portion extending inwardly and downwardly at an acute angle from a side surface to form a cutting edge therewith, each side surface having associated therewith a pair of adjoining outer land portions and an intermediate land portion, said intermediate land portion being arcuate and extending inwardly from a respective side surface to said intermediate face portion at an angle of less than ninety degrees to said respective side surface.

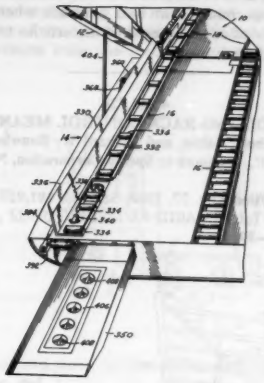
4,344,726

CARGO HANDLING APPARATUS

Faisal A. Naffa, Huntington Beach, Calif., assignor to Brooks & Perkins, Incorporated, Southfield, Mich.

Filed Apr. 2, 1979, Ser. No. 26,426
Int. Cl.³ B60P *7/00*
U.S. Cl. 410—79 **26 Claims**

1. Cargo handling apparatus for aircraft comprising a load restraining rail assembly having a series of lock mechanisms spaced along its length, each said lock mechanism having a load engaging locking element and an operating means individual thereto and operable by a crew member at said lock mechanism to move said locking element to locked position, and linkage means interconnecting the said operating means for said locking elements in such manner that actuation of any intermediate one of such operating means is operable to actuate



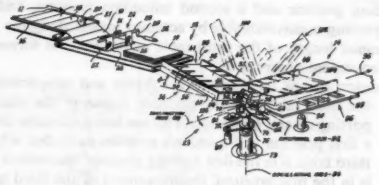
all other said operating means located along the rail assembly from said one operating means.

4,344,727

METHOD AND APPARATUS FOR STACKING AND COLLATING ARTICLES

Premysl G. Chaloupka, Gulf Breeze, Fla., assignor to St. Regis Paper Company, New York, N.Y.

Filed Sep. 22, 1980, Ser. No. 188,998
Int. Cl.³ B65G *57/08*
U.S. Cl. 414—36 **13 Claims**



1. Apparatus for stacking and collating similarly configured, generally flat articles, comprising:

structure defining a receptacle adapted for holding a plurality of articles in non-aligned, roughly stacked relationship therewithin, the receptacle having an opening therein through which the articles may pass into the receptacle and being provided with a pair of adjacent sidewalls respectively extending along a corresponding pair of adjacent edges of each of the articles; and

means connected with the receptacle for mounting it for multidirectional movement including

(1) means for rotating the receptacle about a first reference axis extending in a direction essentially parallel to the plane defined by one of said sidewalls, whereby to urge one edge of each of the articles toward said one sidewall by the influence of gravity,

(2) means for tilting the receptacle about a second reference axis extending in a direction generally perpendicular to the first reference axis, whereby to urge the other edge of each of the articles to shift under the influence of gravity toward the other of said sidewalls,

(3) means for revolving the receptacle about a third reference axis extending in a direction perpendicular to the second axis from a loading position to a discharge position; and

(4) means for causing the receptacle to vibrate upon rota-

tion and tilting of the receptacle, said last named means cooperating with the rotating means and tilting means to urge each of the articles to shift relative to each other and into contact with said sidewalls whereby to align the pair of edges of each of the articles to produce an aligned stack thereof

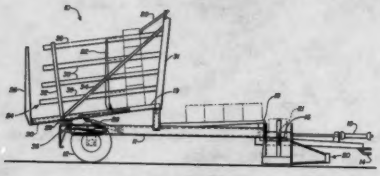
---

4,344,728

ROLLING RACK CONTROL MEANS

James M. Echols, Selma, and Richard W. Bouwhuis, Reedley, both of Calif., assignors to Sperry Corporation, New Holland, Pa.

Filed Aug. 27, 1980, Ser. No. 181,927
Int. Cl.³ A01D *87/12*; B65G *57/32*
U.S. Cl. 414—39 **10 Claims**



1. In a bale wagon having a mobile frame with pick-up means mounted to the frame to pick up bales of crop material from a field and transfer them to a first bale receiving table, a second table mounted to the frame rearwardly of the first table to receive bales from the first table to form a tier of bales, a third table pivotally mounted to the frame rearwardly of the second table of predetermined length having a front end and a rear end to receive the tier of bales from the second table and form a stack, the third table being movable between a first loading position and a second unloading position, and stack supporting means movable by actuator means along the predetermined length of the third table as the stack is formed, the improvement comprising:

control means mounted to the frame and cooperable with the third table and the actuator means of the stack supporting means, said control means being movable between a first position and a second position such that when the third table is in the first loading position the control means is in the first position, the movement of the third table to the second unloading position causing the control means to move to the second position which in turn causes the actuator means to effect a movement of the stack supporting means fully to the rear end of the third table before the stack of bales is unloaded.

4,344,729

BREAK-AWAY DEVICE

Winston A. Orsinger, Nazareth, and George Fallos, Easton, both of Pa., assignors to Bell and Howell Company, Phillipsburg, N.J.

Filed Feb. 8, 1980, Ser. No. 120,014
Int. Cl.³ B65H *3/32*; B66C *1/42*
U.S. Cl. 414—226 **7 Claims**

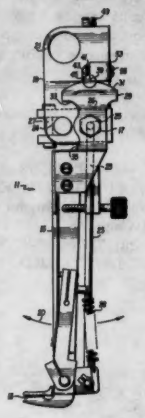
1. A gripper jaw assembly suitable for clockwise and counterclockwise rotation to and from a supply station of an inserting machine, said assembly comprising:

an upper gripper arm having a top portion and a bottom portion, said upper gripper arm being rotatable about an axis passing therethrough;

a lower gripper arm having a top portion, a bottom portion, a front side, and a back side, said front side facing said supply station and said back side being opposite thereto, said lower gripper arm further having gripper jaws at said bottom portion thereof;

a coupling pivotally connecting the top portion of said lower griper arm to the bottom portion of said upper gripper arm; and,

a key member positioned between said upper gripper arm and said lower gripper arm, said key member generally maintaining said upper gripper arm and said lower gripper



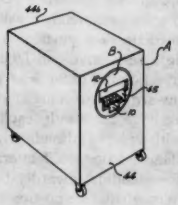
arm in a substantially rigid, colinear relationship but enabling said lower gripper arm to rotate about said coupling and thereby out of said substantially colinear relationship when one of said sides of said lower gripper arm impacts a resistant body.

4,344,730

EGG TRANSFER APPARATUS

Lester I. Dvorak, Rte. 1, Box 90F, Little Mountain, S.C. 29075

Filed Jul. 29, 1980, Ser. No. 173,417
Int. Cl.³ B65G *65/30*
U.S. Cl. 414—405 **10 Claims**



1. Apparatus for transferring eggs from an incubator setter tray having compartments in which eggs are individually contained to a hatcher tray in which said eggs are loosely co-mingled and contained, said apparatus comprising:

main frame means;

secondary frame means carried by said main frame means;

first tray carrier means carried by said secondary frame means for holding said setter tray;

second tray carrier means carried by said secondary frame means for holding said hatcher tray adjacent said setter tray, said hatcher tray having an open top being positioned by said second tray carrier means to generally co-extend with said setter tray;

one of said first and second carrier means being carried by said secondary frame means so as to be movable towards the other of said carrier means;

first drive means for moving said movable carrier means to

an egg transfer position relative to said other carrier means;

said secondary frame means being rotatably carried by said main frame means; and

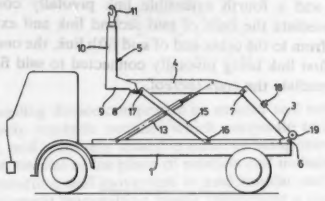
second drive means for rotating said secondary frame means to reverse the respective positions of said setter and hatcher trays following movement of said movable carrier means to said egg transfer position.

4,344,731

EQUIPMENT FOR RAISING AN EXCHANGE PLATFORM OR CONTAINER TO A HORIZONTAL POSITION ABOVE THE LEVEL OF THE TRANSPORT POSITION

Heikki Visa, Vanhalinna, and Heikki Laitinen, Raisio, both of Finland, assignors to Oy Partek AB, Finland

Filed Aug. 26, 1980, Ser. No. 181,364
Claims priority, application Finland, Oct. 19, 1979, 793246
Int. Cl.³ B60P *1/64*
U.S. Cl. 414—471 **5 Claims**



1. Equipment for loading an exchange platform onto a vehicle, removing same from the vehicle, and dumping the exchange platform, comprising:

a rear frame pivotally mounted to the rear end of the frame of the vehicle;

a middle frame pivotally mounted at one of its ends to said rear frame;

an angle piece pivotally mounted proximate the other end of said middle frame, said angle piece including a vertical portion and a grasping component at the upper end of said vertical portion;

a piston and cylinder device connected between the vehicle frame and the middle frame; and

means for maintaining said middle frame in a substantially horizontal raised position when said piston and cylinder device is actuated to move said middle frame and pivot said rear frame relative to the vehicle frame, thereby forming an obtuse angle between said rear and middle frames.

4,344,732

SYSTEM FOR HANDLING HEAVY AND UNWIELDY VEHICLES

Charlie M. Stokes, P.O. Box 1963, Auburn, Ala. 36830

Filed Jan. 29, 1980, Ser. No. 117,643
Int. Cl.³ B66F *9/12*
U.S. Cl. 414—607 **8 Claims**

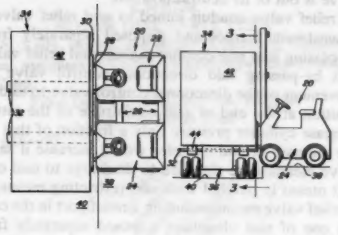
1. In combination, a heavy and unwieldy load vehicle and means for lifting and moving the load vehicle, said load vehicle including means associated with the lower surface thereof by which the load vehicle can be lifted and moved, said means for lifting and moving the load vehicle comprising:

at least two independently maneuverable power driven vehicles interconnected in side-by-side relation to form a single unit,

means detachably connecting the power driven vehicles together to enable independent use,

a lifting assembly solely extending transversely of all of the vehicles forming the unit, spaced from the connecting means and connected to all of said power driven vehicles,

a pair of lifting forks included in the lifting assembly and connected with all of the vehicles forming the unit for lifting and moving the load vehicle, said lifting assembly, said pair of lifting forks and said at least two power driven vehicles constituting said single unit operatively connected to form a large forklift to lift and manipulate the load vehicle from one surface to another at a different



elevation and move the load vehicle from one location to another, and

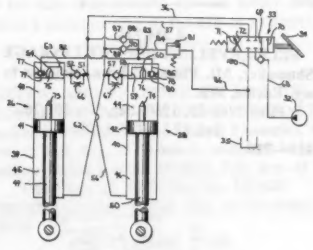
bottom frame means included in said load vehicle being provided with spaced slots receiving said pair of lifting forks, said bottom frame means distributing the weight of the load vehicle and a lifting force over a large area.

4,344,733

HYDRAULIC CONTROL CIRCUIT FOR DECELERATING A SWINGING BACKHOE

Arthur E. Hirsch, Terre Haute, Ind., assignor to J. I. Case Company, Racine, Wis.

Filed Sep. 17, 1979, Ser. No. 76,165
Int. Cl.³ B66C *23/00*
U.S. Cl. 414—694 **3 Claims**



1. In a material handling backhoe with a boom, a hydraulic control circuit for positioning and controlling deceleration of said boom comprising: a hydraulic actuator including a cylinder with a piston slidable therein, a rod connected to the piston extending from the cylinder and operatively connected to said boom, said piston defining first and second opposed expansible and contractible fluid chambers in the cylinder; a manually positionable directional control valve having a neutral first position and second and third positions for porting fluid to stroke the piston in either direction of movement; first conduit means connecting the directional control valve to port fluid to and from the first fluid chamber; second conduit means connecting the directional control valve to port fluid to and from the second fluid chamber; and a deceleration control for cushioning stopping movement of the piston at the end of one of its strokes including

(a) restricting means responsive to movement of the piston at the end of one of its strokes for substantially blocking flow through that one of said first and second fluid conduit

means which is discharging fluid when the piston is at the end of said one stroke;

(b) relief valve means communicating with that one of said first and second fluid chambers which is contracting during said one stroke of said piston, for relieving fluid pressure by discharging fluid from said one chamber, said relief valve means remaining shut during a substantial portion of the stroke of said piston when said control valve is out of its neutral position;

(c) a relief valve conduit joined to said relief valve means downstream thereof and disposed separately from and by-passing said one conduit means, said relief valve conduit by-passing said directional control valve so that movement of the directional control valve to said neutral position at the end of said one stroke of the piston will increase cylinder pressure only a fraction of that amount the pressure in said cylinder would increase if said relief valve means were disposed to discharge to said one conduit means in parallel with said restricting means;

said relief valve means including a relief port in the contracting one of said chambers disposed separately from the discharging one of said first and second conduit means, a first pressure relief valve communicating with said relief port, and a second pressure relief valve downstream of and in series flow relation with said first pressure relief valve so that as the piston approaches the end of said one stroke, substantially all of the fluid discharged out of said cylinder flows through said relief port whereby the first pressure relief valve and the second pressure relief valve have a cumulative effect in controlling cylinder pressure; and

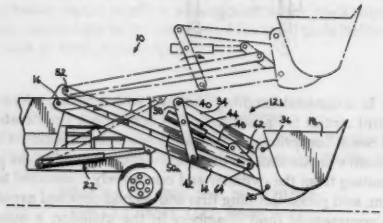
conduit means including one way valve means for interconnecting and providing fluid flow from the first and second fluid conduit means to the second pressure relief valve without cross connecting said first and second conduit means, whereby the second pressure relief valve operates to control piston deceleration when said piston is in mid-stroke if the operator moves the directional control valve to its neutral position.

4,344,734

SELF-LEVELING BUCKET LINKAGE

John F. Shumaker, Mt. Pleasant, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed May 23, 1980, Ser. No. 152,762
Int. Cl.³ E02F 3/70
U.S. Cl. 414—710 **3 Claims**



1. A self-leveling loader, comprising:

(a) a frame;

(b) a material handling implement disposed at the front end of said frame;

(c) a lift arm pivoted at one end to said frame and pivoted at the opposite end to said implement, that end of said lift arm pivoted to said implement defining the implement end of said lift arm;

(d) first extensible means, joining said frame and said lift arm, for raising and lowering said implement relative to said frame;

(e) tilting means, carried by said lift arm and coupled to said implement, for rotating said implement about said lift arm between a dumped position and a rolled back position;

(f) driven means, carried by said lift arm and operatively associated with said first extensible means, for moving said tilting means along the implement end of said lift arm simultaneously with the rotation of said lift arm whereby said implement is maintained generally at the same orientation relative to said frame while said lift arm is rotated between raised and lowered positions by said first extensible means

said driven means including a first link having one end operatively connected to said tilting means and having the other end pivotally connected to said frame,

said tilting means including a second link having one end pivotally connected to said lift arm intermediate the ends thereof, the other end of said second link being pivotally connected to one end of a third link, the other end of the third link being pivotally connected to said implement,

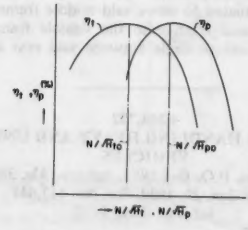
said tilting means further including a fifth link having one end pivotally connected to the implement end of said lift arm, and a fourth extensible link pivotally connected intermediate the ends of said second link and extending therefrom to the other end of said fifth link, the one end of said first link being pivotally connected to said fifth link intermediate the ends thereof.

4,344,735

METHOD OF CONTROLLING TWO-STAGE HYDRAULIC PUMP-TURBINES

Sachio Tsunoda, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Aug. 25, 1980, Ser. No. 180,561
Claims priority, application Japan, Aug. 28, 1979, 54/109288
Int. Cl.³ F01B 17/14
U.S. Cl. 415—1 **4 Claims**



1. In a method of controlling a two-stage hydraulic pump-turbine, rotating at a constant speed under a steady condition, in which high and low pressure stages are connected through a return passage, and degrees of openings of guide vanes of said high and low pressure stages are variable, the improvement which comprises the steps of simultaneously controlling the degrees of openings of said guide vanes of said high and low pressure stages to be the same when said two-stage hydraulic pump-turbine operates as a pump, and independently controlling the degrees of openings of the guide vanes to be different when said pump-turbine operates as a turbine in accordance with a change of an operational condition at the time of the steady operation.

4,344,736

SEALING DEVICE

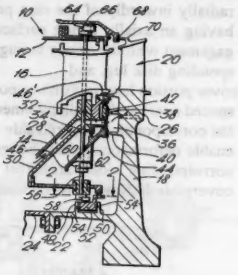
Willie Williamson, Shelton Lock, England, assignor to Rolls-Royce Limited, London, England

Filed Oct. 20, 1980, Ser. No. 198,467

Claims priority, application United Kingdom, Nov. 22, 1979, 7940380

Int. Cl.³ F03B 15/00; F01B 25/00

U.S. Cl. 415—14 6 Claims



1. A sealing device comprising an annular seal member and a relatively rotatable member which cooperate to seal a gas volume, said relatively rotatable member being movable in a direction normal to the plane of rotation and including means for transmitting said movement to said annular seal member, said movement transmitting means comprising a ring located coaxially on said rotatable member for relative rotation and movable therewith in said direction normal to the plane of rotation, pivotable means and pivot links connecting said ring to said annular seal member via said pivotable means, the arrangement being such that, on said ring and rotatable member moving in a direction normal to the plane of relative rotation thereof some of said links pivot said pivoting means and the pivoting means pivots the remaining links which in turn move the annular seal member in unison with, and in the same direction as said rotatable member, to maintain the gas seal therebetween.

4,344,737

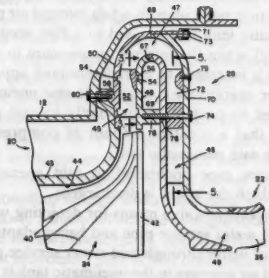
CROSSOVER DUCT

Hsin-Tuan Liu, Scottsdale, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jan. 30, 1978, Ser. No. 873,638

Int. Cl.³ F01D 9/02

U.S. Cl. 415—199.1 20 Claims



1. A crossover duct for turning radially outward gas flow to a radially inward direction comprising a duct entrance portion forming a radially outward gas flow path; a duct exit portion forming a radially inward gas flow path; and a turning bend of generally semi-elliptical cross section between said entrance and exit portions and having inner and outer walls forming a gas flow path for turning gas flow from a radially outward to a radially inward direction, said inner wall including a pair of generally elliptical quadrants each having a ratio of major to minor axis of at least about 1.20, and said outer wall including a pair of generally elliptical quadrants each having a ratio of major to minor axis of at least 1.15.

4,344,738

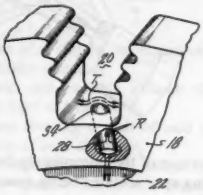
ROTOR DISK STRUCTURE

Wallace N. Kelly, Bolton, and Roger D. Breunig, Meriden, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 17, 1979, Ser. No. 103,980

Int. Cl.³ F01D 5/08

U.S. Cl. 416—95 6 Claims



1. For a gas turbine engine, a rotor disk having an axis of symmetry and slot means which adapts the disk to receive a plurality of coolable rotor blades comprising:

a rim section having an elongated hole extending outwardly about a longitudinal axis through the rim section which is in gas communication with the slot and which has a plurality of hole sections perpendicular to the longitudinal axis, each hole section having an elliptical shape and having a major axis and a minor axis;

wherein the major axis of each section lies in a plane perpendicular to the axis of symmetry, and the minor axis of each section lies in a plane parallel to the axis of symmetry.

4,344,739

HINGELESS AND BEARINGLESS MULTIBLADE ROTOR FOR ROTARY WING AIRCRAFT

Hans Derschmidt, Putzbrunn, and Hubert Frommlet, Siegertsbrunn, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 25, 1980, Ser. No. 143,628

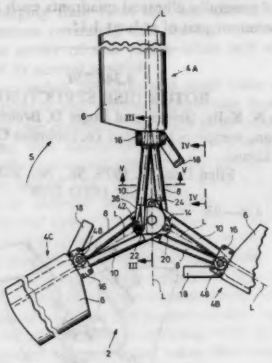
Claims priority, application Fed. Rep. of Germany, May 16, 1979, 2919684

Int. Cl.³ B64C 27/38

U.S. Cl. 416—141 12 Claims

1. A hingeless and bearingless multiblade rotor for rotary wing aircraft, comprising: substantially rigid rotor hub means having a rotational axis and including a plurality of mounting points around the periphery of the rotor hub means; a plurality of lift producing wing means each having a longitudinal wing axis extending substantially radially relative to said rotational axis, each wing means including its respective blade root and at least two spar sections of elastic material for connecting each wing means to respective ones of said mounting points on the rotor hub means with said at least two spar sections, said spar sections being of substantially equal length and elastically bendable and responsive to loads in the torsional direction extending radially and longitudinally of the wing means, to loads in the flapping direction and to loads in the lead-lag direction, each wing means being connected to the rotor hub means at its mounting points all of which are located in or behind, as viewed radially inwardly along the respective longitudinal wing axis, a plane extending perpendicularly to the respective wing axis and in said rotational axis, whereby the

freely twistable length of the spar sections is optimized, said at least two spar sections of a wing means being arranged so that with reference to the direction of rotation of the rotor, the trailing spar section of each rotor blade means overlaps the



leading spar section of the immediately following rotor blade, said overlapping spar sections being spaced apart in the axial direction of the rotor, said spar sections thereby forming a staggered, overlapping arrangement.

4,344,740

ROTOR ASSEMBLY

Donald R. Trenschel, Lake Park, and Wilho V. Aho, Jr., West Palm Beach, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 28, 1979, Ser. No. 79,915
Int. Cl.³ F01D *5/30*
U.S. Cl. 416—221 **4 Claims**

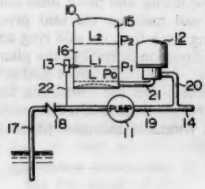
1. A rotor assembly comprising:
a rotor disk formed about an axial centerplane and having
a plurality of attachment slots spaced circumferentially about the periphery of the rotor disk,
a side wall in the region of the attachment slots which is tapered away from the centerplane at the periphery of the disk,
a radially inwardly facing, cylindrical surface at a location radially inwardly of the side surface and of the attachment slots,
a cylindrical arm extending laterally of the disk at a location inward of the inwardly facing cylindrical surface and having a plurality of radially outwardly extending lugs, each lug having an axial surface facing the centerplane;
a plurality of rotor blades equal in number to the number of attachment slots, one blade extending outwardly from each attachment slot and having a root in interlocking engagement with said slot; and
a one-piece sideplate covering the engaged attachment slots and blade roots at one side of the disk, said sideplate having
a ring portion including a radially outwardly facing, cylindrical surface in interference engagement with the inwardly facing, cylindrical surface of the disk,
a plurality of circumferentially spaced lugs equal in number to the number of disk lugs and extending radially inwardly of the ring portion with each lug having an axially facing surface in interference engagement with the axially facing surface of the corresponding disk lug, and
a cover portion having a disk opposing surface which is spaced apart at the radially inner region thereof from the corresponding, tapered side surface of the disk to enable deformation of the cover portion against the corresponding side surface at engagement of the coverplate lugs with the disk lugs.

4,344,741

AUTOMATIC WATER SUPPLY SYSTEM

Tomohiko Taki, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 18, 1980, Ser. No. 131,423
Claims priority, application Japan, Mar. 22, 1979, 54-32374
Int. Cl.³ F04B *49/02*
U.S. Cl. 417—28 **7 Claims**

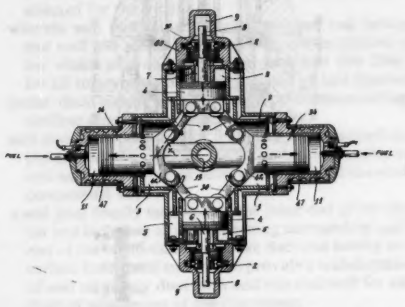


1. An automatic water supplying system comprising:
a pneumatic tank for storing therein and confining compressed air;
a water suction pipe for feeding water to the pneumatic tank;
a pump connected to the water suction pipe and being adapted to suck water through the suction pipe;
a pressure switch operatively connected to said pump and adapted to turn said pump on when internal air pressure in the pneumatic tank is decreased to a first predetermined limit and off when the internal air pressure in said pneumatic tank is increased to a predetermined upper limit;
an air charger operatively connected to said pneumatic tank and adapted to control an air supply to said pneumatic tank such that a constant amount of compressed air is confined in said pneumatic tank;
a water service pipe connected to said pneumatic tank through which the water is discharged;
a pressure responsive valve means for detecting water pressure in said water service pipe and being adapted to shut off a flow of water through said water service pipe when the internal air pressure in the pneumatic tank is decreased to a second predetermined lower limit which is less than the first predetermined lower limit;
a first opening end of said pressure responsive valve means is connected to said pneumatic tank, and a second opening end is connected to a discharge side of said pump and to said water service pipe.

4,344,742
ENGINE APPARATUS

James J. Ferris, 39 N. High St., Clinton, Conn. 06403

Continuation of Ser. No. 644,751, Dec. 29, 1975, Pat. No. 4,140,440, Continuation-in-part of Ser. No. 537,116, Dec. 30, 1974, abandoned. This application Dec. 4, 1978, Ser. No. 966,097
The portion of the term of this patent subsequent to Feb. 20, 1996, has been disclaimed.
Int. Cl.³ F04B *17/00, 35/00;* F02B *25/08*
U.S. Cl. 417—343 2 Claims

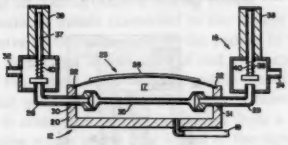


1. An improved fuel-operated device comprising a pair of combustion cylinders having pistons therein each having slidably disposed piston rods extending therefrom operatively arranged in opposing facing relation to each other such that said piston rods are urged through power strokes towards each other along a first movement path, means for admitting a gas-producing type fuel for said combustion cylinders effective to cause an initially maximum pressure expanding gas in said cylinders for powering said piston rods through said power strokes a pair of pressure transfer fluid cylinders having pistons therein each having slidably disposed piston rods extending therefrom operatively arranged in opposing facing relation to each other such that said pressure transfer fluid cylinder piston rods are urged through fluid pressure strokes away from each other along a second movement path oriented perpendicularly and in crossing relation to said first movement path, passage means connected from said pressure transfer fluid cylinders to a storage means for flowing said pressure transfer fluid thereto, an outlet connection from said storage means to a pressure fluid-operated motor for allowing said pressure transfer fluid to power said motor in operation in the performance of work utilizing said pressure transfer fluid energy, and a coupling linkage means strategically located at the intersection of said first and second movement paths operatively interconnected between said piston rods of said combustion and said pressure transfer fluid cylinders so as to produce said fluid pressure strokes in the latter in response to said power strokes of the former said coupling linkage means including pivotally interconnected links in a diamond-shaped configuration effective to initially cause an amplification of said movement occurring along said first movement path in said corresponding extent of movement occurring along said second movement path and subsequently a reversal therein whereby despite an initial maximum pressure in said expanding gas of said fuel there is produced in said fluid a pressure at a desirable starting minimum value which subsequently builds up therein to thereby contribute to the efficiency of the conversion of said fuel energy into usable pressure fluid energy.

4,344,743
PIEZOELECTRIC DRIVEN DIAPHRAGM MICRO-PUMP

Samuel P. Bessman, 7404 Woodrow Wilson Dr., Los Angeles, Calif. 90046, and Lyell J. Thomas, Jr., 1900 Pelican Ave., San Pedro, Calif. 90732

Filed Dec. 4, 1979, Ser. No. 100,094
Int. Cl.³ F04B *17/00*
U.S. Cl. 417—317 2 Claims



1. A pump having an inlet and an outlet and comprising:
a sealed variable volume chamber;
a flexible tube inside said variable volume chamber and connected to said inlet and outlet;
a piezoelectric means forming a wall of said chamber for varying the volume of said chamber;
an essentially non-compressible liquid within said chamber to transmit forces created inside said chamber to said flexible tube during the volume variation of said chamber;
solenoid valve means for controlling the flow of fluid through said inlet and outlet; and
control means connected to said piezoelectric means and said solenoid valve means for electrically activating said piezoelectric means and said solenoid valve means in a desired sequence to pass fluid from said inlet to said flexible tube and to pump fluid from said flexible tube to said outlet, said control means comprising an oscillator means for providing an electric signal output of a selectively fixed frequency, adjustable valve opening duration means for controlling the time duration of activation of said solenoid valve means, a step-up transformer having the secondary connected across said piezoelectric means and the primary adapted to alternately conduct current in opposite directions according to said oscillator output signal, first switch means activated by said oscillator output signal for providing current in alternate, opposite directions to said primary, and second switch means for activating said valve opening duration means according to said oscillator frequency;
whereby the volume of fluid pumped by and through said flexible tube is a function of the selectively fixed oscillator output frequency and the adjustable time duration of activation of said solenoid valve means.

4,344,744
SPRAY PUMP

Wilhelm Schuster, and Jürgen Stahl, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to Pfeiffer Zerstäubervertriebsgesellschaft mbH & Co. KG, Fed. Rep. of Germany

Filed Jan. 16, 1980, Ser. No. 112,678
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1979, 2902624
Int. Cl.³ F04B *21/04;* G01F *11/02*
U.S. Cl. 417—550 14 Claims

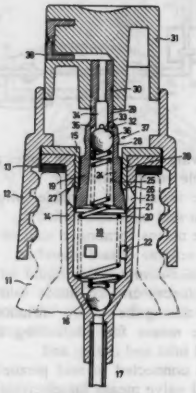
1. A spray pump for liquid in a reservoir, of the type having a pump cylinder defining a pump chamber, a piston movable in the chamber to develop fluid pressure, an actuating pushbutton arranged to move the piston axially in the chamber, an atomization nozzle arranged to receive the liquid from the chamber, and a liquid outlet valve located between the pump chamber and the atomization nozzle, the spray pump adapted to force liquid along a flowpath from the pump chamber to the nozzle when the piston moves in a first direction and to draw liquid

from the reservoir into the chamber when the piston moves in a second, opposite direction, the outlet valve comprising:

a valve body having an arcuate circumferential sealing surface;

a tubular member defining at least a part of the flowpath and having a resilient portion of substantially uniform cross-section for receiving the valve body, the resilient portion being radially deformed into a bulge, along its length, by the arcuate circumferential sealing surface of the valve body, the resilient portion thereby having an inner counter-sealing surface of arcuate form, the sealing and counter-sealing surfaces closing the flowpath when the piston moves in the second direction, the bulge of the resilient portion being further radially deformed and enlarged, along its length, by fluid pressure when the piston moves in the first direction, separating the sealing and counter-sealing surfaces, and opening the flowpath; and,

a stop for holding the valve body against axial movement in the tubular member during movement of the piston in the first direction.



4,344,745

SELF-SEALING GEAR PUMP WITH SEALING PRESSURE DIVIDER

Gert Herrmann, Solingen, Fed. Rep. of Germany, assignor to Pierburg Luftfahrtgeräte Union GmbH, Neuss, Fed. Rep. of Germany

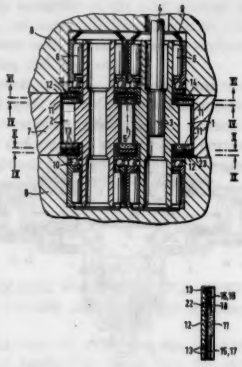
Filed Sep. 19, 1979, Ser. No. 77,137

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1978, 2846547

Int. Cl.³ F04C *2/18, 15/00*

U.S. Cl. 418—132 15 Claims

1. In a self-sealing gear pump comprising a casing having internal wall surfaces, a pair of meshing gear wheels having two end faces, at least one of said end faces and one of said internal wall surfaces defining a gap and sealing means sealing said gap, said sealing means including a thrust plate interposed between said end face and said wall surface, means defining a cavity on the side of said thrust plate remote from said end face, said cavity extending between a high pressure and a low pressure side of said pump and being of an annular configuration, and first nozzle means communicating said cavity with said high pressure side of said pump to produce a fluid pressure in said cavity, the improvement wherein said thrust plate is resistant to bending and has a first surface area exposed to said fluid pressure within said cavity and a second surface area exposed to a pressure of said fluid on said high pressure side of said pump, said first surface area being greater than said second surface area and means operative together with said cavity and said first nozzle means to form pressure divider means whereby said fluid pressure in said cavity is adjustable in dependence upon operating parameters of said pump, said pressure divider means further comprising second nozzle means communicating said cavity to a low pressure side of said pump, said second nozzle means extending through said sealing means and having a flow cross-sectional area which is smaller than a flow cross-sectional area of said first nozzle means which communicates said cavity with said high pressure side of said pump, said sealing means further comprising a backing plate in said casing between one of said walls and said thrust plate, said second nozzle means being formed through said backing plate, and valve means associated with said second nozzle means, said valve means being responsive to at least one of an increase in pressure and a fall in temperature in said pump, said valve means being provided at a flow outlet of said second nozzle means, said flow outlet being disposed in a face of said backing plate opposite said thrust plate and said valve means including a spring plate covering said outlet and acting as pressure-responsive valve means.



4,344,746

DISTRIBUTOR FOR THE PROGRESSIVE AND REVERSIBLE SUPPLY OF AN AIR MOTOR, IN PARTICULAR FOR HAND-HELD DENTAL INSTRUMENTS

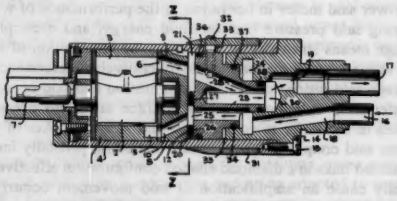
Henri Leonard, Besancon, France, assignor to Societe Micro-Mega S.A., Besancon, France

Filed Apr. 18, 1980, Ser. No. 141,645

Claims priority, application France, Apr. 20, 1979, 79 10720

Int. Cl.³ F01C *13/02, 21/14*

U.S. Cl. 418—270 8 Claims



1. A motor control system comprising:

a casing;

a blade-type motor including a rotor chamber in which a rotor is positioned; said motor being mounted in said casing;

a rotary air distributor positioned inside said casing for both rotation about and movement along its axis;

said distributor being freely slidably movable along its axis to at least a limited extent;

a manually operated actuator positioned externally of said casing and connected to said distributor for permitting the manual rotation of said distributor;

one end of said rotor chamber being defined by an end wall having first, second, and third flow ducts extending through said end wall and positioned with a spacing of 120° between adjacent ones of said flow ducts;

said first flow duct always comprising an outlet opening for discharging exhausted drive air with said second and third flow ducts being of the same size and shape and being alternatively employed as either an inlet opening or an outlet opening in accordance with the rotational direction selected for the motor;

wherein said distributor includes an inner end facing said end wall and which inner end includes an outflow chamber which is in communication with said first flow duct for all rotary positions of adjustment of said distributor;

outlet duct means in said distributor communicating said outflow chamber with the atmosphere;

said distributor additionally including a compressed-air supply duct having an inner end in facing relationship to said end wall and having an outer end connected to a source of compressed air;

a seal joint fixedly mounted on the inner end of the distributor and including a central opening surrounding said inner end of the compressed-air intake duct and having an outer surface facing said end wall to provide a sealed connection of said air supply duct with said one end wall for all positions of adjustment of the distributor;

means for urging said distributor axially toward said end wall; and

wherein said distributor is capable of rotation from a first position in which the inner end of said compressed-air supply duct is aligned with said second flow duct and said first and third flow ducts communicate with said outflow chamber so as to effect rotation of the motor in a first direction through an intermediate position in which said inner end of said compressed-air supply duct is blocked by said end wall so that the motor does not rotate to a second position in which the inner end of said compressed-air supply duct is aligned with said third flow duct and said first and second flow ducts communicate with said outflow chamber so as to effect rotation of said motor in a second direction opposite to said first direction.

4,344,747

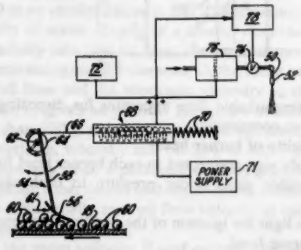
SENSING APPARATUS FOR PELLETIZING PROCESS

Richard K. Henry, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 974,417, Dec. 29, 1978, abandoned. This application Jul. 23, 1980, Ser. No. 171,514

Int. Cl.³ B01J 2/14

U.S. Cl. 425—140 **9 Claims**



1. In an apparatus for pelletizing particulate batch material, the apparatus being a pellet forming means having a slanted rotatable member, means for suppyling particulate batch material to the pellet forming means, means for supplying liquid to the pellet forming means, means for rotating the rotatable member in a given direction, the pellet forming means being so arranged and constructed that the liquid and particulate batch material combine to form pellets, the improvements comprising:

(a) pivotably mounted paddle means deflectable in one direction upward and away from the rotatable member by contact with substantially finished pellets and deflectable in an opposite direction towards the rotatable member by a spring or counterbalance biasing means;

(b) a transducer means connected to the paddle means and responsive to the deflection of the paddle to provide an output signal that is indicative of and proportional to the size of the pellets deflecting the paddle means;

(c) a signal generating means to provide a reference signal which is compared to a second signal from a liquid flow measuring means and is then added to the signal from the transducer means to provide a sum signal; and

(d) a valve means which is responsive to the sum signal and operable to increase or decrease the liquid flow to adjust the size of the pellets produced.

4,344,748

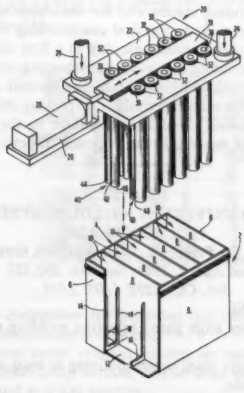
APPARATUS FOR DEFORMING MOLDED BATTERY CASE

Terry Oxenreider, Wernersville, and William J. Eberle, Reading, both of Pa., assignors to General Battery Corporation, Reading, Pa.

Filed Aug. 7, 1980, Ser. No. 176,254

Int. Cl.³ B29C 24/00

U.S. Cl. 425—143 **14 Claims**



1. An apparatus for modifying the between the ribs space of a thermal plastic battery container, said apparatus comprising:

a wiping member for modifying said ribs, said wiping member having a non-circular outer surface;

means for positioning said wiping member within said battery container;

heating means for heating said wiping member to a temperature sufficient for softening said thermal plastic; and

means for rotating said wiping member.

4,344,749
INJECTION STRETCH-BLOW MOLDING APPARATUS FOR THE MANUFACTURE OF BIAXIALLY ORIENTED HOLLOW BODIES FROM THERMOPLASTIC MATERIAL

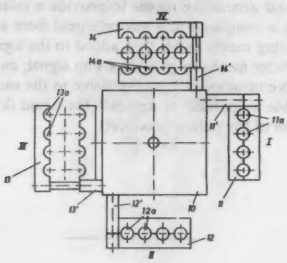
Hans-Gerhard Fritz, Uhingen, and Helmut Scharrenbroich, Neunkirchen-Seelscheid, both of Fed. Rep. of Germany, assignors to Voith Fischer Kunststofftechnik GmbH & Co. KG, Fed. Rep. of Germany

Filed Apr. 11, 1980, Ser. No. 139,472

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1979, 2917055

Int. Cl.³ B29C *17/07*

U.S. Cl. 425—174.4 **21 Claims**



1. An injection stretch-blow molding apparatus, comprising:

an injection molding station for injection molding plastic preforms, first and second conditioning stations including means for affecting the condition of injection molded preforms, and a blow mold station for stretch-blowing preforms which have been conditioned at one of the conditioning stations;

rotary transport means for transporting preforms injection molded at the injection molding station to the other stations; and

the transport means being circularly movable back and forth alternately in two opposite directions, and including means for transporting injection molded preforms to the first conditioning station and for simultaneously carrying other preforms from the first conditioning station to the blow mold station while moving in a first circular direction, and including means for transporting preforms from the injection molding station to the second conditioning station and for simultaneously transporting other preforms from the second conditioning station to the blow mold station while moving in the opposite direction.

4,344,750
EDGE GATED INJECTION MOLDING SYSTEM WITH HOLLOW SEALS

Jobst U. Gellert, 7A Prince St., Glen Williams, Ontario, Canada

Filed Apr. 2, 1981, Ser. No. 250,237

Int. Cl.³ B29F *1/03, 1/08*

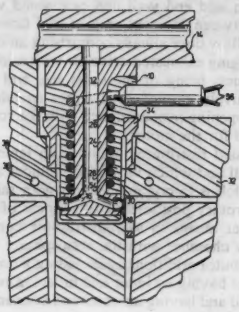
U.S. Cl. 425—548 **4 Claims**

1. A hot runner edge gated injection molding system comprising:

(a) cooled cavity plate means defining at least one openable cavity therein;

(b) a hollow electrically heated sprue bushing securely seated in a well in the cavity plate means, the well having an inner wall which is spaced from the sprue bushing to form an insulative air gap therebetween, the sprue bushing having an elongated central melt passage extending from a melt inlet to at least one channel extending radially outward from the central passage to at least one corresponding edge gate in the cavity plate means, the edge gates leading to said cavity; and

(c) at least one corresponding hollow seal having a central bore extending between an inner end and an outer end which is dome shaped with a central opening therethrough, the seal extending across said air gap with its central bore being in alignment with said radially extending channel and said gate, the inner end being seated in a recess in the sprue bushing and the outer end abutting



against the inner wall of the well in the cavity plate, at least a portion of the wall being slightly inwardly tapered whereby the seal is gradually slightly inwardly deformed as the sprue bushing is inserted into the well and the system heated to operating temperatures to prevent substantial leakage of the pressurized melt into the air gap.

4,344,751
FLARES

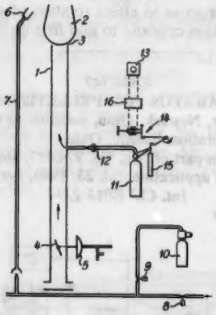
David A. Chesters, Walton-on-Thames, England, assignor to The British Petroleum Company Limited, London, England

Filed Mar. 19, 1980, Ser. No. 132,321

Claims priority, application United Kingdom, Mar. 24, 1979, 7910430

Int. Cl.³ F23D *13/20*; F23B *5/00*

U.S. Cl. 431—202 **8 Claims**



1. An extinguishable flare apparatus for disposing of combustible gases comprising:

(a) a plurality of burner heads,

(b) a supply pipe connected to each burner head for passing combustible gases under pressure to each said burner head,

(c) a pilot light for ignition of the combustible gases at each said burner head,

(d) a supply line connected to each said pilot light for passing pilot gas under pressure to said pilot light,

(e) a source of flame extinguishing material,

(f) connecting means for supplying said flame extinguishing material to the supply pipes and the supply lines and for

terminating the flow of pilot gas to the pilot lights, said connecting means comprising a cylinder connected through a valve and a restriction orifice to an inlet in each of said supply pipes, said inlets being upstream from said burner heads,

(g) actuating means connected to said connecting means comprising a control apparatus for controlling the operation of a synchronisation means, a triggering apparatus triggered by said synchronisation means, and a switching apparatus controlled by said triggering apparatus for opening said valve;

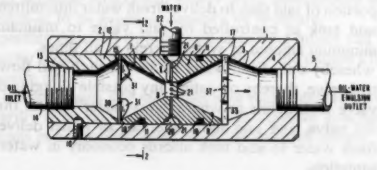
(h) synchronisation means for controlling the operation of said actuating means so as to delay actuation of said connecting means until said supply pipes are depressurized, and to cause the release of said flame extinguishing material to said supply pipes and supply lines when said connecting means activates so that said flame extinguishing material reaches each of said burner heads and pilot lights simultaneously.

4,344,752

WATER-IN-OIL EMULSIFIER AND OIL-BURNER BOILER SYSTEM INCORPORATING SUCH EMULSIFIER

John P. Gallagher, Jr., Pennsauken, N.J., assignor to The Trane Company, La Crosse, Wis.

Filed Mar. 14, 1980, Ser. No. 130,513
Int. Cl.³ F23D *13/14*
U.S. Cl. 431—354 **22 Claims**



1. Improved method of making a uniformly fine water-in-oil emulsion for use as a clean-burning and efficiently-burning fuel in an oil-burning heat-producing system, by establishing and maintaining a substantially cylindrical oil flow, constrained by a substantially cylindrical internal constraining surface of diameter D in an emulsifier body, and simultaneously injecting a multiplicity of water streams of a smaller diameter d approximately radially into said oil flow; the improvement wherein:

the constraining surface diameter D, the mean velocity V_o of the oil flow and the kinematic viscosity ν_o of the oil are chosen to given an oil flow Reynold's number Re_o much less than 1200, and said internal constraining surface is oil-wettable, whereby said oil flow is 100% laminar macroscopically, with a parabolic velocity profile, having its maximum shear rate at said constraining surface combined with substantially zero oil flow velocity at said constraining surface;

setting the mean velocity $\overline{V}_W$ of each of said water streams comparable with or lower than $\overline{V}_o$; and

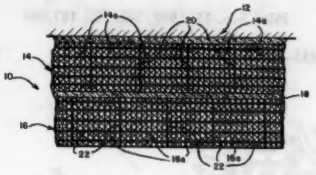
providing a swirl-imparting member in communication with said constraining substantially cylindrical internal surface of diameter D for imparting a swirl to the oil flow prior to said injection of water.

4,344,753

METHOD FOR REDUCING THE THERMAL INERTIA OF A FURNACE OR OVEN WALL AND INSULATED WALL PRODUCED THEREBY

Stanley J. Shelley, Dewsbury, and Harold G. Emblem, Mirfield, both of England, assignors to Clinotherm Limited, Dewsbury, England

Filed Oct. 1, 1980, Ser. No. 192,655
Int. Cl.³ F27D *1/16, 1/00;* B32B *1/04*
U.S. Cl. 432—3 **9 Claims**



6. In a furnace or oven, an insulating layer secured to the walls for reducing the thermal inertia thereof, comprising

a first insulating layer having a first usable temperature range;

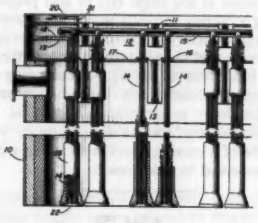
a second insulating layer having a second usable temperature range higher than said first temperature range secured to the first insulating layer and comprising modules of the typed formed with refractory fibers disposed with one end "end-on" to the plane of one end of the module, the module being further composed of a wrapping of thermally combustible material holding the fibers in elastic compression whereby when said wrapping is thermally destroyed, the module is free to expand.

4,344,754

WATER COOLED VERTICAL GAS DISTRIBUTOR

Harlan G. Graf; Harry R. Janssen, and Don L. Edwards, all of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Feb. 20, 1981, Ser. No. 236,422
Int. Cl.³ F27D *1/12;* F22B *37/00;* C21B *7/10*
U.S. Cl. 432—233 **1 Claim**



1. A gas distributor for injecting gas into a hot process vessel, said distributor comprising:

(a) a central metal conduit having an outlet end, a main longitudinal body section, and an inlet end adapted to be connected to a gas source;

(b) a plurality of cooling water inlet lines extending along and adjacent to the outer surface of said main longitudinal body section;

(c) a plurality of cooling water return lines extending along and adjacent to the outer surface of said main longitudinal body section, said return lines being spaced from said inlet lines;

(d) an insulation layer covering said main longitudinal body section and said water inlet and return lines; and

(e) baffle means attached to the outlet end of said central

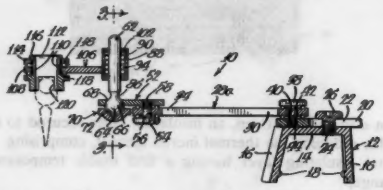
metal conduit, said baffle means being adapted to receive cooling water from said cooling water inlet lines, direct the cooling water around the outlet end of said distributor, and discharge the cooling water to said cooling water return lines.

4,344,755

DENTAL HANDPIECE GUIDE

Henry O. Gold, 1250 Willow Rd., Winnetka, Ill. 60093, and Charles D. Gold, 673 W. Wrightwood Ave., Chicago, Ill. 60614

Filed Sep. 15, 1980, Ser. No. 187,084
Int. Cl.³ A61C *3/02*
U.S. Cl. 433—76 **11 Claims**



1. A dental handpiece guide for guiding a cutting instrument to cut parallel surfaces, cuts or holes in the axial direction on teeth in a mouth or on a model, comprising:

a base portion adapted to be secured to the teeth, said base portion having an upper face;

a parallel link assembly rotatably mounted on said base portion at first mounting points, and extending from said base portion and lying in a plane generally parallel to the plane containing the upper face, said parallel link assembly comprising at least one set of two generally parallel arms;

a post carrier assembly rotatably mounted on the distal ends of the arms of said parallel link assembly at second mounting points, said second mounting points being spaced from each other generally the same distance as the first mounting points of said base portion are from each other;

a post mounted on said post carrier assembly;

a sleeve slidably received by said post and adapted to rotate about the post; and

a projecting arm having one end mounted to said sleeve, and having means at the distal end of said projecting arm for receiving a cutting instrument, which comprises a generally circular aperture, and wherein a generally cylindrical basket is received by said projecting arm through its aperture and held from escape by a circular ring and flange on the basket, the central axis of the basket and the central axis of the sleeve are substantially parallel, which basket has a hollowed-out portion defined by its wall to receive the handle of a cutting instrument when a cutting instrument is received by said basket.

4,344,756

WATER RECYCLER FOR DENTAL OPERATORIES

Richard P. Folkenroth, Dover, and Thomas J. Dunn, Red Lion, both of Pa., assignors to Dentsply Research & Development Corp., Milford, Del.

Filed Sep. 28, 1981, Ser. No. 305,824
Int. Cl.³ A61C *17/04*
U.S. Cl. 433—92 **3 Claims**

1. A dental evacuating system for operatories to withdraw debris and liquids from the oral cavity of dental patients comprising in combination,

a. water seal-type vacuum pump means requiring a supply of water at all times and including inlet and discharge ports,

b. conduit means leading from an operatory to the inlet port of said pump means,

c. an air-water separator unit including a tank having inlet and discharge means, said discharge means being at a level above said inlet ports of said water seal vacuum pump means to provide feed by gravity,

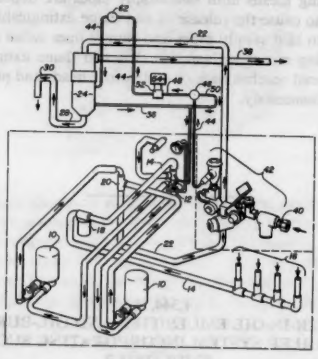
d. exhaust conduit means leading from the discharge port of said pump means to the inlet means of said separator unit,

e. at least the lower portion of said tank serving as a water reservoir to supply sealing water to said pump means by gravity,

f. discharge means on said tank arranged and operable to maintain a minimum amount of water therein at all times,

g. fresh water conduit means connectable to a supply of municipal water,

h. a flow-control valve connected to said fresh water conduit means,



i. a timer connected to said valve and operable to open the same for successive very short predetermined intervals of time to permit limited flow of fresh water therethrough, and

j. delivery conduit means for said fresh water connected at one end to said valve and at the other end to the lower portion of said tank to deliver fresh water intermittently to said tank as controlled by said valve to maintain said minimum amount of water therein at all times,

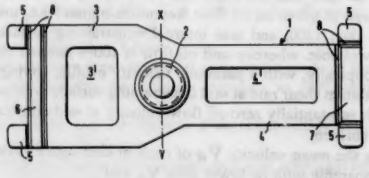
k. whereby only fresh water passes through said flow control valve, thereby obviating any possible clogging of said valve with debris as where "gray water" passes through the valve, and said short intervals of timed delivery of fresh water to said tank affords economy in water consumption.

4,344,757

IMPLANT A GEOMETRY VARIABLE

Robert Streel, rue Leon Mignon 21, 4000 Liege, Belgium

Filed May 9, 1980, Ser. No. 148,308
Claims priority, application Belgium, May 17, 1979, 6/46833
Int. Cl.³ A61C *8/00*
U.S. Cl. 433—173 **7 Claims**



1. A variable geometry implant comprising

a base formed with perforations,

a threaded shaft extending from said base,

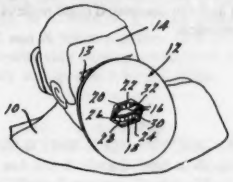
said base is asymmetrically irregular with respect to the shaft, but in perfect balance with respect to said shaft,
the base has surface areas respectively on both sides of the shaft which are equal but different in shape, and
the perforations on both sides of the shaft are equal in area but different in shape.

4,344,758

DENTAL FACE SHIELD

Sandra L. Wielhouwer, Union Lake, and Suzanne M. Fortner, Farmington Hills, both of Mich., assignors to John D. Wielhouwer, Union Lake, Mich.

Filed Apr. 6, 1981, Ser. No. 251,175
Int. Cl.³ A61C 5/14
U.S. Cl. 433—137 **13 Claims**



1. A face shield for use on a patient's face in dental operations, comprising
means for absorbing moisture providing the exterior surface of said shield directed away from the face;
barrier means disposed adjacent said absorbing means providing an interior protective surface directed towards the face;
adhesive attachment means secured to said barrier means, said adhesive attachment means being substantially unaffected as to its adhesive capacity by moisture;
an aperture disposed through said absorbing means and said barrier means of a size large enough for the patient's open mouth; and
said barrier means and said absorbing means extending outwardly from said aperture and said adhesive attachment means in a direction away from the patient's mouth.

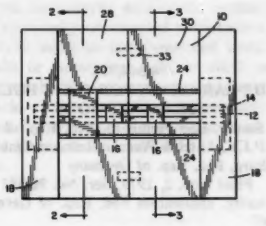
4,344,759

METHOD AND APPARATUS FOR INDUCING PSYCHOLOGICAL RESPONSES

Stuart Albert, 1713 E. Florida Ave., Apt. 201, Urbona, Ill. 61801

Filed Oct. 14, 1980, Ser. No. 196,589
Int. Cl.³ G09B 1/14
U.S. Cl. 434—236 **4 Claims**

1. An apparatus for eliciting psychological responses from human beings, said apparatus comprising:
(a) a board having a channel extending transversely across the surface thereof;
(b) at least two symbols movably positioned in said channel;
(c) means for supporting and moving said symbols within said channel;
(d) at least one stationary panel secured to said board and spaced therefrom, said stationary panel covering a section of said channel to permit a symbol to be positioned therebehind to remove the symbol from view;
(e) a pair of tracks extending transversely across the surface of said board parallel to said channel, one track disposed on either side of said channel; and
(f) at least one movable panel secured to and movable within said tracks whereby selected portions of said channel can



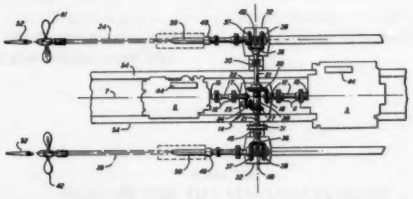
be blocked from view and the symbols movable within said channel can be positioned therebehind.

4,344,760

MARINE PROPULSION SYSTEM

Andrzej S. Kulikowski, 35-221 Ormskirk Ave., Toronto, Ontario, Canada (M6S 1A8)

Filed Aug. 15, 1979, Ser. No. 66,674
Int. Cl.³ B63H 21/00, 23/10
U.S. Cl. 440—3 **8 Claims**



1. In a propulsion system for a cruising boat or the like, a primary operating engine and a secondary engine having less power than the primary engine, the primary and secondary engines being in line with one another substantially on the fore and aft center line of the boat, a main transmission assembly located between the two engines on said center line, the output shafts of the engines being operably connected to the transmission assembly, an athwartships shaft passing through the transmission assembly and extending outwardly therefrom toward the opposite sides of the boat, a transmission gear case unit operably connected to each end of the athwartships shaft, a pair of laterally spaced propeller shafts disposed in substantially parallel relation to the fore and aft center line of the boat, the inboard end of each propeller shaft being respectively operably connected to one of the transmission gear cases, a double acting clutch in the main transmission assembly for connecting either the primary or secondary engine output shaft to the athwartships shaft, and clutch means in each transmis-

sion gear case operable to drivingly connect its propeller shaft to the athwartships shaft.

4,344,761

SIDE-BAR CHAIN FOR CONE PULLEY TRANSMISSIONS

Herbert K. Steuer, Bad Homburg, Fed. Rep. of Germany, assignor to P.I.V. Antrieb Werner Reimers GmbH & Co. KG, Bad Homburg, Fed. Rep. of Germany

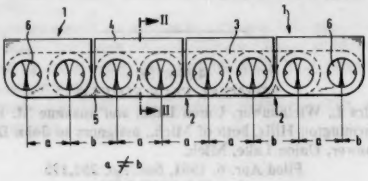
Filed Nov. 2, 1979, Ser. No. 90,587

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1978, 2848167

Int. Cl.³ F16G 5/18

U.S. Cl. 474—245 **4 Claims**

1. In a side-bar chain for an infinitely variable cone pulley transmission, which is composed of packs of side bars forming successive links which are articulatedly connected with one another, and thrust pieces acting transversely of the longitudinal direction of the chain for friction force transmission between cone pulleys and the side-bar chain, the improvement



wherein the lengths of selected ones of said links, between associated articulations, are different from those of the remainder of said links of said chain for minimizing vibrations between said chain and the associated cone pulleys during operation of the transmission.

4,344,762

SOAKING METHOD

Rolf Monsheimer, Darmstadt, and Ernst Pfleiderer, Darmstadt-Arheilgen, both of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Oct. 27, 1980, Ser. No. 201,048

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1979, 2944461

Int. Cl.³ C14C 1/04

U.S. Cl. 8—94.18 14 Claims

1. A method for soaking preserved skins or hides adaptable to the preparation of leather which consists essentially of soaking said skins or hides in an aqueous bath having a pH between 9 and 11 and consisting essentially of water and a compound selected from the group of compounds of the formula

and acid addition salts thereof, wherein R taken alone is —H, $—NH_2$, $—CH_3$, or —NHCN, X taken alone is =O, =S, or =NH, and R and X taken together form a five- or six-membered heterocyclic ring having conjugated double bonds and containing only nitrogen as a hetero atom.

4,344,763

REACTIVE SILICONE HAIR SETTING COMPOSITIONS

Eva Tolgyesi, and Ann F. Bresak, both of Rockville, Md., assignors to The Gillette Company, Boston, Mass.

Filed Nov. 15, 1977, Ser. No. 851,748

Int. Cl.³ A61K 7/11

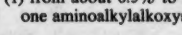
U.S. Cl. 8—127.51 10 Claims

1. A method of setting hair comprising the steps of:

(a) wetting the hair with water;

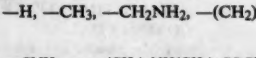
(b) applying to the hair an effective amount of an isopropanol solution containing

(1) from about 0.5% to about 15% by weight of at least one aminoalkylalkoxysilane having the formula



wherein

R_1 is —H, $—CH_3$, $—CH_2NH_2$, $—(CH_2)_2NH_2$,



R_2 is methyl, ethyl, propyl, isopropyl, butyl, or isobutyl, and

n is selected from the values 2 and 3, and

(2) from about 0.0005% to about 1.5% by weight of a titanate ester having the formula

wherein R_3 is methyl, ethyl, propyl, isopropyl, butyl, or isobutyl, and

(c) arranging the hair in a desired configuration.

4,344,764

DESIZING OF TEXTILES CONSISTING OF OR CONTAINING CELLULOSE

Wilfried Kothe, and Heinz-Dieter Angstmann, both of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 23, 1979, Ser. No. 23,357

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1978, 2814354

Int. Cl.³ D06L 1/14; D06M 11/04, 15/38; D06L 1/06

U.S. Cl. 8—138 2 Claims

1. A process for desizing textiles, consisting of or containing cellulose, in the presence of persulfate, wherein the starch-sized textile is impregnated with a desizing liquor having a pH of from 12 to 14, which contains

(a) from 0.1 to 3 g/l of peroxydisulfate and

(b) from 0.1 to 5 g/l of a water-soluble polymer of acrylic acid which may contain up to 50 mole% of methacrylamide, acrylamide, acrylonitrile, methacrylonitrile, acrylic acid esters, methacrylic acid esters, methacrylic acid or other ethylenically unsaturated monocarboxylic acids or dicarboxylic acids as copolymerized units, their alkali metal salts or ammonium salts, or alkali metal salts or ammonium salts of copolymers of maleic acid and styrene, maleic acid and a vinyl ester or maleic acid and a vinyl ether, and the impregnated textile is then left to dwell for from 1 to 30 minutes at from 20° to 130° C., after which it is rinsed.

4,344,765

PROCESS FOR THE PREPARATION OF TRANSFER PRINTS ON OPTIONALLY REGENERATED CELLULOSE FIBERS AND THEIR MIXTURES WITH POLYESTER FIBERS

Friedrich Reinhardt, Neuenhain, and Helmut Schmidt, Hofheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 741,396, Nov. 12, 1976, abandoned.

This application Jun. 28, 1979, Ser. No. 52,767

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1975, 2551410

Int. Cl.³ D06P 5/00, 3/82

U.S. Cl. 8—471 24 Claims

1. A process for coloring a fabric containing natural or regenerated cellulose fibers, which comprises contacting said fabric at a temperature of 180° to 220° C. with a carrier sheet which is covered with a layer containing a disperse dyestuff capable of subliming in said temperature range, said fabric being impregnated prior to or after said contacting with a thickening composition consisting essentially of (1) a synthetic polymer having carboxy groups or an alkali metal or ammonium salt thereof, or (2) an aqueous liquor containing, per liter, 10 to 500 g of an aqueous solution or dispersion containing 2 to 10% by weight of a thickening agent and 50 to 200 g of polyalkylene oxide compound.

4,344,766

PROCESS FOR THE MANUFACTURE OF PREPARATIONS WITH A LOW DUST CONTENT

Jurgen Lahrs; Klaus Schubert, both of Cologne; Claus Gosling, Leverkusen; Dorde Jovcic, Leichlingen; Harald Gleinig, Odenthal, and Reiner Skerhut, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 20, 1981, Ser. No. 255,933

Claims priority, application Fed. Rep. of Germany, May 10, 1980, 3018029

Int. Cl.³ C09B 67/08; B32B 7/02

U.S. Cl. 8—524 3 Claims

1. In a process for the manufacture of pulverulent or granular preparations having a low dust content, by spraying the preparation with a dustproofing agent, the improvement comprising:

adjusting the dustproofing agent spray to an average particle size of less than 10 microns and

applying said agent in an amount of 0.01 to 4%.

4,344,767

PROCESS FOR COLORING LINEAR POLYESTERS IN THE MELT

Gerhard Umsonst, Frenkendorf; Hans P. Kölliker, Münchenstein, and Max Jost, Oberwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

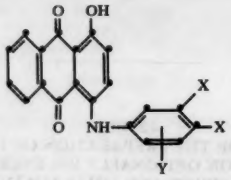
Filed May 20, 1981, Ser. No. 265,472

Claims priority, application Switzerland, May 29, 1980, 4186/80

Int. Cl.³ C09B *1/00*; C08L *67/00*

U.S. Cl. 524—159 9 Claims

1. A process for colouring linear polyesters in the melt, which process comprises the use of a 1-hydroxy-4-phenylaminoanthraquinone of the formula



(I)

wherein one X is a hydrogen atom or methyl group and the other is an alkylsulfonyloxy or chloroalkylsulfonyloxy group and Y is a hydrogen or halogen atom or an alkyl group.

4,344,768

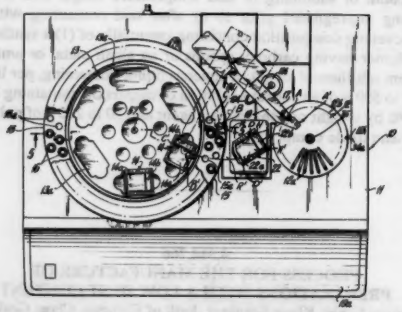
AUTOMATIC PIPETTOR

Bernard Parker, Westport, Conn., and Brian Parsonnet, Mamaroneck, N.Y., assignors to Baker Instruments Corp., Bethlehem, Pa.

Filed Mar. 27, 1981, Ser. No. 248,531

Int. Cl.³ G01N *1/14, 35/06, 33/48*

U.S. Cl. 23—230 R 25 Claims



24. Method for automatically and rapidly transferring accurate and precise multiple quantities of sample and reagent solution to a rotatable transfer disc having a plurality of radial cavities therein, which method comprises;

(a) placing said transfer disc onto a rotatable support member;

(b) randomly loading a predetermined number of receptacles containing sample solution into a rotatable sample ring;

(c) randomly loading a predetermined number of receptables containing reagent solution into a rotatable reagent

(d) providing a first transfer arm having a sample nozzle at one end thereof adapted to move laterally between said transfer disc and said sample ring and to pivot about a point located near the opposite end thereof whereby said sample nozzle is able to selectively move into a predetermined sample receptable for picking up a specific sample solution;

(e) providing a second transfer arm having a reagent nozzle at one end thereof adapted to move laterally between said transfer disc and said reagent tray and to pivot about a point located near its opposite end whereby said reagent nozzle is able to selectively move into a predetermined reagent receptable for picking up a specific reagent solution;

(f) providing a receptacle containing diluent-wash solution at a location intermediate said transfer disc and said sample ring and accessible to said sample and reagent nozzles;

(g) rotating said transfer disc to index a specific radial cavity to be filled at a designated dispense position;

(h) rotating said sample ring to index a specific sample receptacle containing a sample solution to be transferred to said transfer disc at a designated sample pick up position;

(i) rotating said reagent tray to index a specific reagent receptacle containing reagent solution to be transferred to said transfer disc at a designated reagent pick up position;

(j) laterally moving said first transfer arm and said second arm to locate said sample nozzle and said reagent nozzle at said sample and reagent pick up positions, respectively;

(k) lowering said sample nozzle into said sample receptacle and aspirating a predetermined, accurate and precise quantity of sample solution therefrom;

(l) lowering said reagent nozzle into said reagent receptacle and aspirating a predetermined, accurate and precise quantity of reagents solution therefrom;

(m) laterally moving said first and second transfer arms to said predetermined radial cavity in said transfer disc at said dispense position;

(n) moving said sample nozzle and said reagent nozzle into said predetermined radial cavity and dispensing said predetermined quantity of sample and reagent solution therein;

(o) repeating steps (g) to (n) inclusive until the designated number of radial cavities in said transfer disc are filled with multiple quantities of sample and reagent solution.

4,344,769

PROCESS AND INSTALLATION FOR TREATING COKING COAL

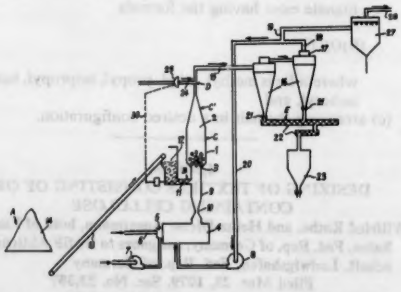
Roger M. Puff, Freyming-Merlebach, and Jean-Claude Kita, Forbach, both of France, assignors to Charbonnages de France, Paris, France

Filed Sep. 2, 1980, Ser. No. 183,416

Claims priority, application France, Sep. 10, 1979, 79 22546

Int. Cl.³ C10L *5/16, 5/22*

U.S. Cl. 44—23 21 Claims



1. A process for treating coal, comprising the steps of:

(a) introducing coal into a preheater chamber;

(b) generating a hot combustion gas in a combustion chamber;

(c) passing said hot gas through the coal in said preheater chamber to preheat and entrain the coal contained therein;
(d) pneumatically conveying the coal by means of said gas along a path from said preheater chamber to a coal/gas separating means;
(e) introducing a hydrocarbon binder in a liquid state into said path by adding said liquid hydrocarbon binder to the coal being pneumatically conveyed in said path;
(f) separating gas from the coal in said separating means; and
(g) removing the coal with hydrocarbon binder thereon from the separating means for further treatment.

3. A process according to claim 1, wherein the hydrocarbon binder has a softening point of between about 30° C. and 100° C.

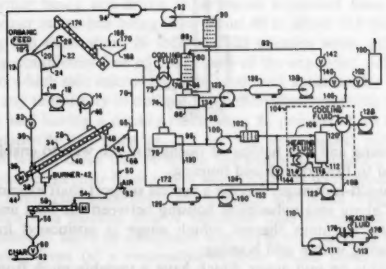
10. An apparatus for treating coking coal, comprising:
a heat exchanger chamber for the treatment of the coal;
means for introducing into the said heat exchange chamber coal which is to be treated therein;
combustion chamber means for burning gas in air and generating a heat transfer gas;
means for introducing said heat-transfer gas from said combustion chamber into said heat exchange chamber at an approximately constant rate, to entrain the coal which has been treated in said heat exchange chamber;
separating means for separating the entrained coal from gas;
a pneumatic conveying duct for conveying the gas-entrained coal from the chamber to the separating means; and
means for introducing a hydrocarbon binder into said pneumatic conveying duct.

4,344,770

METHOD AND APPARATUS FOR CONVERTING SOLID ORGANIC MATERIAL TO FUEL OIL AND GAS

Erwin L. Capener, Palo Alto, and James M. Low, Fresno, both of Calif., assignors to Wilwardco, Inc., San Jose, Calif.

Filed Nov. 4, 1977, Ser. No. 848,444
Int. Cl.³ C10L *1/00*
U.S. Cl. 44—50 **38 Claims**



1. A method of converting organic material such as sawdust, wood chips, sewage sludge, agricultural products, and the like, to fuel oil comprising,
heating organic material for at least partial pyrolytic conversion to pyrolytic gases,
separating by condensing means said gases into liquid and gas phases by condensing condensable vapor included in said gases,
separating said liquid phase by first gravity separating means into water and oil fractions,
distilling said water fraction from said first gravity separating means for separation of water soluble oil therefrom, and
combining said water soluble oil from said distillation step with the oil fraction from said first gravity separating means to lower the viscosity and add to the energy content thereof.

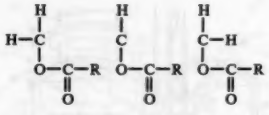
4,344,771

FUEL AND LUBRICANT ADDITIVES FROM ACID TREATED MIXTURES OF VEGETABLE OIL DERIVED AMIDES AND ESTERS

Benedict R. Bonazza, and Albert N. DeVault, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 936,308, Aug. 23, 1978, Pat. No. 4,269,606, which is a continuation-in-part of Ser. No. 714,159, Aug. 13, 1976, abandoned. This application Mar. 10, 1981, Ser. No. 242,494
Int. Cl.³ C10L *1/14*
U.S. Cl. 44—63 **12 Claims**

1. A composition useful as a detergent additive package for lubricants and fuels prepared by reacting multiamine with vegetable oil to obtain a first product mixture, said vegetable oil selected from among triglycerides of long-chain monocarboxylic acids of the formula



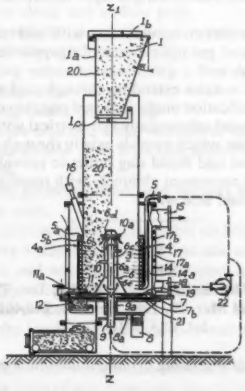
wherein R is an aliphatic radical of about 10 to about 25 carbon atoms said first product mixture further reacted with sulfonic acid to obtain a second product mixture said second product mixture dissolved in an amount of hydrocarbon solvent sufficient to maintain said second product mixture in solution.

4,344,772

GAS GENERATOR WITH FIXED BED AND REVERSE DRAUGHT, TO GASIFY SOLID COMBUSTIBLE MATERIALS

Jean-Claude Pillard, Marseilles, France, assignor to Entreprise Generale de Chauffage Industriel Pillard, Marseilles, France

Filed Nov. 17, 1980, Ser. No. 207,632
Claims priority, application France, Nov. 16, 1979, 79 28661
Int. Cl.³ C10J *3/68*
U.S. Cl. 48—76 **11 Claims**



1. Gas generator with fixed bed and reverse draught, to gasify solid combustible materials, comprising a cylindrical drying and pyrolysis enclosure of vertical axis, which is equipped at its upper end with a loading compartment, the lower end being opened and communicating with a co-axial combustion chamber the wall of which is composed of a shell-plate which is lined on the inside with one or more coils of which the lower ends are connected to one or more air-inlets

and wherein the upper ends are connected to an annular collector situated on the junction between the said enclosure and the said combustion chamber, the annular collector comprising air outlets inclined downwardly and towards the axis.

4,344,773

APPARATUS FOR THE GASIFICATION OF CARBON AND/OR CARBON-CONTAINING MEDIA

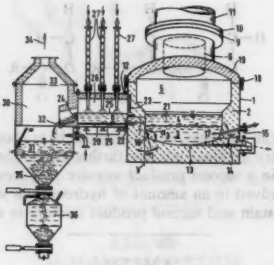
Peter Paschen, Bergisch Gladbach; Roland Pfeiffer, Cologne; Heinz-Dieter Waldhecker, Bergisch Gladbach; Alfred Krycxun, and Rolf Pufal, both of Cologne, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Dec. 18, 1980, Ser. No. 217,816

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1979, 2950865

Int. Cl.³ C10J *3/20*

U.S. Cl. 48—92 **11 Claims**



1. Apparatus for the gasification of carbon-containing media for the continuous production of a gas essentially containing CO and H_2 and a molten bath of iron-containing metal, comprising:

means defining a reaction chamber including a floor, a side wall and a top for holding the bath;

a feed opening communicating with said reaction chamber for supporting a flow of a carbon-containing medium;

a gas outlet in said top communicating with said reaction chamber and connected gas-tight therewith for carrying of the gas;

a liquid slag outlet communicating with said reaction chamber and sealed gas-tight thereto for supporting a flow of a liquid phase; and

a plurality of nozzles extending through said side walls for feeding gasification media into said reaction chamber, said nozzles located substantially symmetrical with respect to a vertical plane which extends axially through said reaction chamber and said liquid slag outlet to provide a predetermined bath movement obliquely with respect to the lower portion of said side wall.

4,344,774

DEGASSER

Uvon Skipper, 7409 S. Rice Ave., Bellaire, Tex. 77401

Filed Mar. 23, 1981, Ser. No. 246,401

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—41 **10 Claims**

1. A method of degassing drilling mud which comprises the steps of:

(a) arranging an upstanding cylindrical housing having a central passage therethrough which passage terminates at a lower opening through said housing to admit drilling mud having gas therein and an upper opening through said housing;

(b) rotating an auger within said cylindrical housing, said auger incorporating a means for lifting drilling mud for moving mud vertically along said cylindrical housing wherein this step varies the rate at which the mud is lifted along the auger and imposes a centrifugal force on the drilling mud to centrifugally force the heavier components of the mud radially outwardly within said housing during lifting to thereby centrifugally move gas bubbles in the drilling mud radially inwardly relative to the mud and wherein the lifting step is continued so that a selected portion of the mud is lifted from the lower opening in the housing to the upper opening thereof whereupon the mud disengages from the gas bubbles entrained therein;

(c) evacuating the upper end of said housing through a forced gas flow means to remove gas;

(d) collecting the mud that flows from the upper opening in said housing in a chamber means;

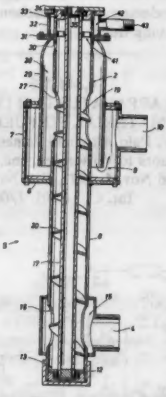
(e) positioning a solid barrier in the chamber means extending from above and toward the chamber means to define a gas free region on one side of the barrier;

(f) filling the chamber means to a depth to extend above the barrier to isolate gas liberated from the mud on one side of the barrier; and

(g) withdrawing degassed drilling mud from the gas free side of the barrier.

7. Apparatus for removing gas from drilling mud which apparatus comprises:

(a) an upstanding cylindrical housing having a wall and having openings at the bottom thereof wherein drilling mud having gas therein is permitted to flow into said



housing and also having an opening in the wall to enable mud to flow out of said housing;

(b) a multi-turn auger having a central support shaft extending along said cylindrical housing between the inlet and outlet openings thereof which auger is positioned for rotating within said housing;

(c) flights on said auger which have a variable pitch from turn to turn thereof wherein the flights of the auger are spaced further apart near the lower end thereof in comparison with the upper end thereof;

(d) means for joining the flights of the auger to the central support shaft inclining the flights radially outwardly downwardly such that the flights of said auger, on rotation about said shaft, causes mud to flow from said inlet opening to said outlet opening and to simultaneously lift the mud while centrifugally forcing the mud toward said cylindrical housing and away from said central shaft supporting said auger wherein the operation of said auger centrifugally separates dissolved gas in the drilling mud;

(e) U-tube means connected to receive mud flow from said outlet openings of said housing to flow the mud toward a U-tube means outlet means and beneath a barrier isolating gas flow from said outlet means; and

(f) gas evacuation means drawing gas from said housing at

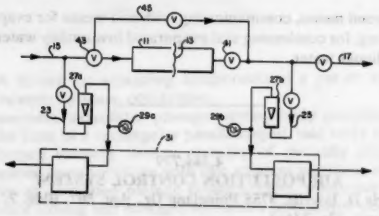
the upper end thereof and from said U-tube means for evacuation of gas liberated from the mud.

4,344,775

METHOD FOR SEPARATING GASES LIQUID DROPLETS AND/OR SOLID PARTICLES FROM GASES OR VAPORS

Max Klein, P.O. Box 3, Dalton, Mass. 01226, assignor to Max Klein, Shrewsbury, N.J.

Continuation-in-part of Ser. No. 18,472, Mar. 8, 1979, which is a continuation-in-part of Ser. No. 877,190, Feb. 13, 1978, abandoned. This application Dec. 16, 1980, Ser. No. 216,953
The portion of the term of this patent subsequent to Dec. 16, 1997, has been disclaimed.
Int. Cl.³ B01D *53/02*
U.S. Cl. 55—75 17 Claims



1. A method for separating undesired substances from a gas or vapor containing same, said method comprising passing a stream of said gas or vapor having said undesirable substances entrained therein through a porous medium comprising glass fibers from about 6.35 millimeters long to below a length at which said fibers are prone to roping, and from about 3 to 12 microns in diameter, intermixed with micro-bits of any of an expanded, thermoplastic styrene-polymer, or lower polyolefin, which is the polymer of an ethylenically unsaturated hydrocarbon monomer having from 2 to 6 carbon atoms, each said polymer being non-brittle in its initial expanded form, said polymer micro-bits being from about 40 to about 325 microns long and from about 20 to about 325 microns wide, substantially completely free of intact cells of the expanded polymer from which said micro-bits were produced, substantially without any uniformity in outline of the individual micro-bit particles, and having a density from about 85 percent of, to about substantially the same as, the specific unexpanded polymer from which there was provided the aforesaid expanded thermoplastic polymer from which said micro-bits were produced, said intermixed glass fibers and polymer micro-bits being permeable to a gaseous and/or vaporous fluid stream and held together in sheet or elongated web form by a binding agent selected from (a) a compatible organic binder insoluable in cold water and soluble in hot water and inert to the glass fibers, the micro-bits and any other constituent of said medium, as well as any gas or vapor or entrained droplets or aerosols and fine particles that are to contact said medium, or (b) a cobeat of cotton fibers and any of said micro-bits, or a mixture of binding agents (a) and (b), said binding agent being distributed throughout the micro-bits and glass fibers so as to hold said micro-bits and glass fibers together in said sheet or elongated web form without destroying the permeability thereof; the constituents being in the following proportions, by weight of said medium:

(i) from about 2 to about 50% of said micro-bits;

(ii) from about 2% to about 10% of said binding agent when the organic binder is used, and from about 5.8% to about 11% of said binding agent when the cobeat binder is used, and

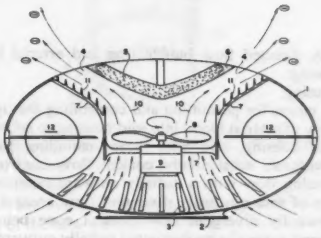
(iii) the balance of said medium being made up of said glass fibers; said medium having tensile strength from about 0.9 to about 5.3 kilograms per centimeter, and thereby separating said undesired substances from said gas or vapor.

4,344,776

ELECTROSTATIC AIR FILTER

Mordechai Yavnieli, Ramat-Hasharon, Israel, assignor to AMCOR Ltd., Tel Aviv, Israel

Continuation of Ser. No. 137,561, Apr. 4, 1980, abandoned. This application May 18, 1981, Ser. No. 264,610
Claims priority, application Israel, Jun. 27, 1979, 57677
Int. Cl.³ B03C *3/12, 3/32*
U.S. Cl. 55—129 5 Claims



1. An electrostatic air filter comprising:

a housing,

air inlet means and air outlet means in the housing,

wall means connecting said air inlet means and said air outlet means and defining an airflow path, said airflow path being substantially Y-shaped in vertical cross-section having a stem portion and a pair of diverging arms ascending from said stem portion,

air transfer means located in the stem portion of said Y-shaped cross-section part of said air flow-path for causing air to flow through the housing from the inlet means to the outlet means along said airflow path,

air ionizing means for generating and introducing charged ions into the throughflowing air,

said air ionizing means located along a first side of each of said diverging arms,

said air ionizing means comprising:

support structure attached along one side of the wall means defining said airflow path from said stem portion to said outlet means,

electro needles extending from said support structure into said airflow path,

a disposable, electrostatically chargeable air filter mat means located along a side opposite said first side of said diverging arms on said wall means spaced apart from and substantially oppositely disposed to said electro needles on a side opposite to the one side,

the path for the ions being transverse to said airflow path, and

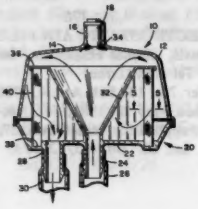
said main airflow path being constructed and arranged such that through both of said divergent arms it is substantially clear of obstructions and extending in a straight line from said air transfer means to said outlet means without substantially intersecting either said air filter mat means or said electro needles so that said dust particles in said airflow path are ionized by ions produced by said needles and attracted to said oppositely charged air filter mat means as said air flows past said mat means from the air transfer means to the outlet means.

4,344,777

DIRECTED FLOW BUBBLE TRAP FOR ARTERIAL BLOOD

George G. Siposs, 2855 Velasco La., Costa Mesa, Calif. 92626

Filed Jan. 7, 1980, Ser. No. 109,801
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—178 24 Claims



12. A directed flow bubble trap and arterial blood filter comprising:

a housing;

inlet means for permitting and controlling the upward inlet flow of arterial blood into said housing to substantially fill said housing, said inlet means including an upwardly divergent, substantially conical flow control cone for causing flow with a radially outward component at the top of said upwardly divergent flow control cone, said upwardly divergent flow control cone being open to permit generally unobstructed radially outward flow at its larger end for reducing blood velocity so that the blood velocity at the top of said upwardly divergent flow control cone in said housing is lower than in said inlet, said housing top having an outlet therein for the release of air collected within the top of said housing;

an arterial blood filter member in said housing, said arterial blood filter member being a corrugated filter medium of woven monofilament screen having between 20 to 60 microns pore size and having first and second sides, said blood filter member being positioned around to surround said flow cone and being secured to said flow cone and to said housing so that said flow cone serves as a support for the upper edge of said filter member so that arterial blood leaving said upwardly divergent flow control cone flows down around said blood filter member and reaches said first side of said arterial blood filter member; and

an arterial blood outlet on said housing, said arterial blood outlet being connected to said housing so that it is positioned on the second side of said arterial blood filter member.

4,344,778

WATER PRODUCING APPARATUS

Hiromasa Matsuoka, Amagasaki; Kenkoku Azuma, Nagoya, and Enju Nishiyama, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1980, Ser. No. 147,126
Claims priority, application Japan, May 15, 1979, 54-59857; Feb. 12, 1980, 55-16233
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—180 7 Claims

1. A water producing apparatus comprising:

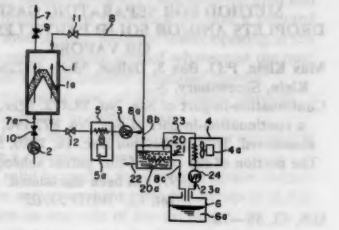
an adsorbent in a confined space;

means communicating with said confined space for contacting said adsorbent with ambient air whereby moisture in said ambient air is adsorbed;

means communicating with said confined space for heating said adsorbent to desorb the moisture adsorbed thereon as steam;

first means communicating with said confined space for condensing said steam;

means, associated with said means for condensing said steam, for evaporating liquid low quality water, whereby the latent heat of condensation of said condensating steam evaporates said liquid low quality water; and



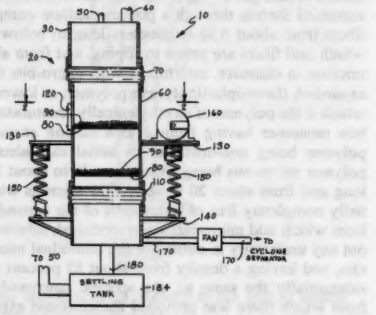
second means, communicating with said means for evaporating, for condensing said evaporated low quality water into liquid water.

4,344,779

AIR POLLUTION CONTROL SYSTEM

Morris D. Isserlis, 3755 Poinciana Dr., Apt. 507, Bldg. 7, Lake Worth, Fla. 33463

Filed Aug. 27, 1980, Ser. No. 181,890
Int. Cl.³ B01D *47/14*
U.S. Cl. 55—233 6 Claims



4. Apparatus for removing undesired matter from dirty gas comprising

a chamber defining a downwardly vertical path for gas and fluid flow,

means for introducing a fluid and a dirty gas substantially simultaneously into an upper portion of said chamber for passage downwardly through said chamber, said dirty gas containing undesired matter to be removed,

means for drawing said gas and fluid downwardly through said chamber,

support means carrying a plurality of small-diameter, generally spherical solids providing a large number of small venturi passages between adjacent solids and impingement surfaces, said support means being disposed across the path of flow of gas and fluid through said chamber so that the gas to be cleaned and fluid impinge upon said solids,

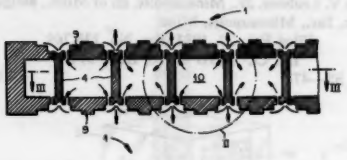
outlet means for separately removing gas and fluid carrying said matter from said chamber, and

means for vibrating said support means for shaking said solids and maintaining them free of adsorbed matter taken out of the gas.

4,344,780
APPARATUS FOR THE SEPARATION OF FLUIDS

Werner Groszstück, Pforzheim, Fed. Rep. of Germany, assignor to Nustep Trenndüsen Entwicklungs- und Patentverwertungsgesellschaft mbH & Co. KG, Essen, Fed. Rep. of Germany

Filed Jan. 29, 1981, Ser. No. 230,105
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1980, 3003266
Int. Cl.³ B01D 53/24
U.S. Cl. 55—347 5 Claims



1. A device for separating components of a gas or vapor fluid mixture by mass, comprising:

a one-piece monolithic passage-forming body generally in the form of a rectangular parallelepiped, said body being formed unitarily with a plurality of mutually parallel spaced-apart partitions with two adjacent partitions defining an elongated passage between them, respective end walls closing said passages alternately on opposite sides of said body, and said passages being closed laterally by opposite lateral walls perpendicular to said partitions and said end walls and disposed on opposite lateral sides of said body, each of said lateral walls being formed with elongated slots diposed on opposite sides of each partition and communicating with a respective passage adjacent a respective partition and extending parallel thereto, portions of said lateral walls which are coplanar with each partition being formed with an outwardly open flow-deflecting groove of curved cross section, each of said lateral walls being formed with an external mounting surface disposed on opposite sides of each groove outwardly of said slots;

a respective nozzle-forming strip reaching into each groove and disposed on each mounting surface of said lateral walls on one side of each groove so as to intercept said fluid mixture emerging from respective slots and direct said fluid mixture into and along a respective one of said grooves; and

a respective skimming baffle reaching into each groove and mounted on said mounting surface opposite that on which said nozzle-forming strip is disposed so as to deflect a heavy component enriched fraction of said fluid mixture into an adjacent one of said passages through respective slots thereof, said baffle and the respective strip of each of said grooves defining a gap between them so as to permit a light component enriched fraction of said mixture to be discharged.

4,344,781
FILTER BAG WITH PROTECTIVE CUFF

Frank Higgins, New Providence; Gilbert G. Lautenshlager, West Millington, both of N.J., and Billy A. Bunn, Aiken, S.C., assignors to United States Filter Corporation, New York, N.Y.

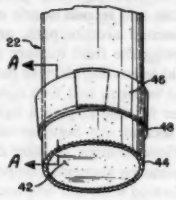
Filed Feb. 3, 1981, Ser. No. 231,135
Int. Cl.³ B01D 46/02
U.S. Cl. 55—379 4 Claims

1. An improved construction for elongate tubular filter bags having one open end and one closed end that are adapted to be supported by an internal elongate rigid gas pervious retainer for use in an assembly for separating particulate matter from a carrier gas stream when such carrier gas stream is directed from a dirty air plenum to a clean air plenum separated by a gas impervious tube sheet having at least one aperture therein providing fluid communication between the dirty and clean air plenums and wherein the open end of such filter bag and retainer is mounted on said aperture and the closed end is disposed remote therefrom and is displaceable together with said retainer transversely of the longitudinal axis of said filter bag, said improved bag comprising:

an elongate tube of permeable fabric filter material having an open end and a second end disposed remote therefrom;

particulate impermeable means for closing said second end of said tube,

means attaching said particulate impermeable means to the second end of said tube to close the same,



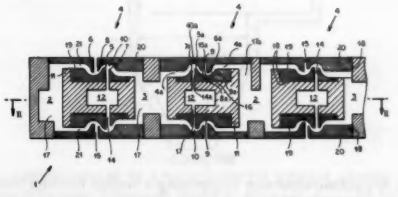
an annular band of material having a first and second longitudinal edge and a length at least equal to the circumference of said tube,

means circumferentially attaching said band to the outer surface of the tube with the first longitudinal edge thereof disposed in attached spaced apart relation from the closed end thereof and with the distance of spacing between the first longitudinal edge and the closed end being less than the width of the band so that the second longitudinal edge thereof extends a substantial distance past said closed end of said tube and forms a peripheral protective skirt thereabout.

4,344,782
APPARATUS FOR THE SEPARATION OF FLUID MIXTURES INTO COMPONENTS OF DIFFERENT MASS

Werner Groszstück, Pforzheim, Fed. Rep. of Germany, assignor to Nustep Trenndüsen Entwicklungs- und Patentverwertungsgesellschaft mbH & Co. KG, Essen, Fed. Rep. of Germany

Filed Jan. 29, 1981, Ser. No. 230,106
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1980, 3003202
Int. Cl.³ B01D 57/50
U.S. Cl. 55—397 4 Claims



1. A device for the trifractional separation of gas mixtures, especially for isotope separation, comprising:

a one-piece body of rectangular plan and cross-sectional configuration formed with partitions subdividing the interior thereof into generally parallel fluid mixture passages, medium fraction discharge passages and heavy fraction discharge passages in succession, wall portions closing one end of each of said passages and means defining openings communicating between said passages, said body

being formed in the region of said openings with fitting surfaces; and

a respective separating element for each group of fluid mixture, medium fraction and heavy fraction passages seated in fitting surfaces and defining in succession between each fluid mixture passage and the heavy fraction discharge passage of the respective group, a first nozzle edge for accelerating the fluid mixture, a first flow-directing groove receiving said first nozzle edge for guiding said fluid mixture in an arcuate path, a first flow splitter for separating components of the fluid mixture guided in said arcuate path, a second nozzle edge for directing a component of the fluid mixture from said arcuate path, a second oppositely curved flow-directing groove receiving the fluid mixture from said second nozzle edge and directing same along a second arcuate path, and a second flow splitter intercepting the fluid mixture along said second arcuate path, said separating element further comprising a first slot formed between said first nozzle edge and said first flow splitter for discharging a light fraction of said mixture and a second slot between said second nozzle edge and said flow medium fraction discharge passage, each of said separating elements comprising an inwardly disposed plate formed with said first nozzle-forming edge, said first flow splitter, said first slot and second groove, and with an outwardly lying plate disposed along the exterior of said devices and formed with said first groove, said second nozzle-forming edge, said second flow splitter and second slot, said plates defining a gap between them generally parallel to the plane of said device.

4,344,783

CYCLONE SEPARATOR

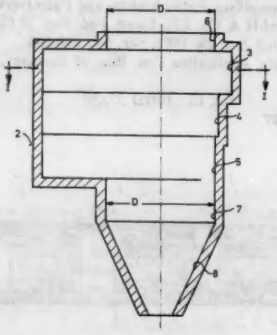
Otto Heinemann, Ennigerloh, and Heinz-Herbert Schmits, Rheda-Wiedenbruck, both of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed Apr. 20, 1981, Ser. No. 255,462

Claims priority, application Fed. Rep. of Germany, May 14, 1980, 3018519

Int. Cl.³ B04C *5/04, 5/081;* **B01D** *45/16*

U.S. Cl. 55—459 B **8 Claims**



1. A cyclone separator comprising a walled housing having at one end an inlet opening and a gas outlet opening, and at its other end a material discharge opening, said inlet opening communicating with each of a plurality of partial spirals spiraling about a common axis and axially spaced from one another in a direction from said one end of said housing toward said other end thereof, each of said partial spirals being of different length, wherein the partial spiral located adjacent said one end being the longest and the partial spiral located adjacent said other end being the shortest, the longest of said partial spirals extending over a peripheral angle of at least 180° and the shortest extending over a peripheral angle of at least 90°, each of said partial spirals having a terminal end axially remote from said inlet opening and located at a substantially uniform radial distance from said axis.

4,344,784

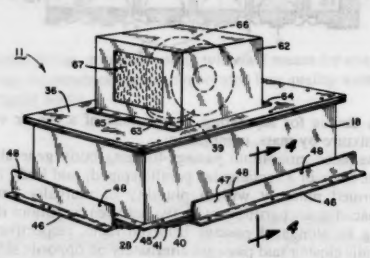
FILTER ASSEMBLY FOR CLEAN AIR ROOMS AND WORK STATIONS

Peter C. Deckas, Edina; James A. Cooper, New Hope, and James V. Leebens, Jr., Minneapolis, all of Minn., assignors to Dexon, Inc., Minneapolis, Minn.

Filed Feb. 27, 1981, Ser. No. 238,769

Int. Cl.³ B01D *46/10;* **B24F** *3/16*

U.S. Cl. 55—473 **12 Claims**



1. A filter assembly for a clean air installation comprising a block of filter material having axially spaced inlet and outlet surfaces and an outer peripheral side surface extending all around the block between the inlet and outlet surfaces, a supporting frame having a side frame portion comprising imperforate, rigid, thin side walls surrounding and closely fitting the peripheral side surface of the filter block, said side frame portion having open inlet and outlet ends defining respective side frame inlet and outlet openings corresponding to the filter block inlet and outlet surfaces, but spaced axially from each other a distance substantially greater than the distance between the inlet and outlet surfaces of the filter block, a layer of adhesive providing an adhesive bond between the outer peripheral side surface of the filter block and the surrounding walls of the side frame portion with the outlet surface of the filter block in essentially the same plane as the side frame outlet opening and with the side frame inlet opening spaced axially upstream from the filter block inlet surface, portions of said side frame walls thereby enclosing the sides and serving as side walls of a plenum chamber volume upstream of the filter block, and the adhesive layer providing an integral seal preventing leakage of air around the filter block from the plenum chamber volume.

4,344,785

MODULAR MOLTEN GLASS COLUMN

Thomas H. Jensen, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

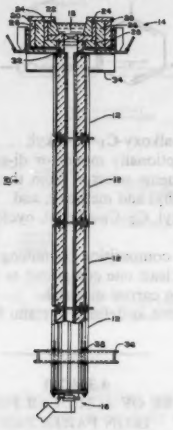
Filed Oct. 2, 1980, Ser. No. 193,194

Int. Cl.³ C03B *37/025*

U.S. Cl. 65—1 **16 Claims**

10. A modular molten glass column for receiving molten glass from a forehearth and to supply the glass to a high pressure glass fiber forming bushing, said column delivering said molten glass to said bushing at high temperatures and pressure, said column comprising at least a first and a second glass modular glass conduit, each of said conduits having a molten glass conveying tube, a ceramic liner surrounding said molten glass conveying tube, heating means secured to said ceramic liner, means to control said heating means, a refractory surrounding

said ceramic liner and an outer housing covering the refractory, means to join the first ends of the modular glass conduits



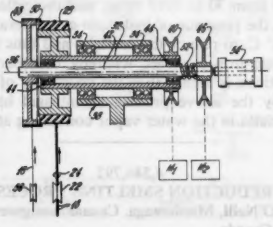
to each other to provide fluid communication with the said conduits to said forehearth and said bushing respectively.

4,344,786

METHOD AND APPARATUS FOR GATHERING STRAND MATERIAL

Alex P. Symborski, and Cecil R. Cunningham, both of Anderson, S.C., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 2, 1981, Ser. No. 222,106
Int. Cl.³ C03D *37/025*
U.S. Cl. 65—2 **13 Claims**



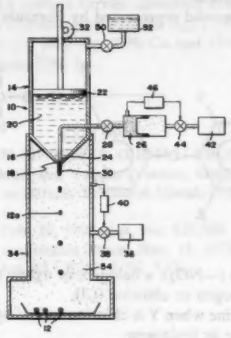
10. A method of gathering strand material comprising gathering strand material from a plurality of sources of strand material to form a combined strand, rotating a roll means at a first rate to pull said combined strand, directing strand material from another source onto a ring means rotating coaxially with said roll means, rotating said ring means at a second rate slower than said first rate to pull said feeder strand, increasing the rotational rate of said ring means to said first rate, moving said ring means axially toward said roll means, and directing said feeder strand onto said roll means.

4,344,787

METHOD AND APPARATUS FOR PRODUCING GAS-FILLED HOLLOW SPHERES

James M. Beggs, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Taylor G. Wang, Glendale, and Daniel D. Elleman, San Marino, both of Calif.

Continuation-in-part of Ser. No. 284,313, Jul. 17, 1981, which is a continuation of Ser. No. 37,072, May 8, 1979, Pat. No. 4,279,632. This application Sep. 18, 1981, Ser. No. 303,671
Int. Cl.³ C03B *19/10*
U.S. Cl. 65—21.4 **6 Claims**



1. Apparatus for forming hollow spheres containing pressured gas, comprising:

a cylinder device having an end, and having a first nozzle at said end;

a second gas nozzle lying in said cylinder near said end thereof and directed in line with said first nozzle;

a gas source connected to said gas nozzle to supply pressured filler gas thereto;

means for supplying a molten solid material to said cylinder device to flow out of said first nozzle;

walls forming an enclosure around an area outside said first nozzle; and

means for maintaining an environment gas at a predetermined pressure of a plurality of atmospheres in said enclosure;

said means for supplying molten material applying a pressure to said molten material which is greater than the pressure of said filler gas supplied by said source and the pressure in said enclosure, whereby to produce a molten gas-filled tube that can break up into hollow sphere-like pieces.

4,344,788

METHOD OF PLANT GROWTH REGULATION

Louis Schneider, Elizabeth; David E. Graham, deceased, late of Westfield, both of N.J., and Fidelity Union Trust Company, Executor, Newark, N.J., assignors to GAF Corporation, New York, N.Y.

Filed Jul. 15, 1980, Ser. No. 169,075
Int. Cl.³ A01N *43/36*
U.S. Cl. 71—76 **2 Claims**

1. A method for retarding the growth of bluegrass which comprises applying to said bluegrass an effective growth retarding amount of N-(chloroacetyl)-N-(N'-methylenepyrrolidonyl)-2-isopropoxyaniline.

4,344,789

ACIDS AND ESTERS OF 5-(2-OPTIONALLY SUBSTITUTED-4-TRIFLUOROMETHYL-6-OPTIONALLY SUBSTITUTED PHENOXY)-2-NITRO, -HALO, OR-CYANO ALPHA SUBSTITUTED PHENYL CARBOXY OXIMES, AND METHOD OF CONTROLLING WEEDS WITH THEM

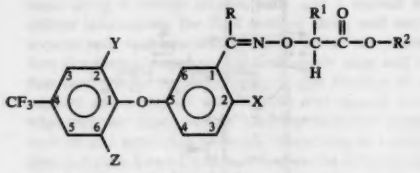
Dennis K. Krass, Canal Fulton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 38,043, May 11, 1979, abandoned. This application Apr. 15, 1980, Ser. No. 136,171

Int. Cl.³ A01N *37/42, 37/50;* **C07C** *131/00*

U.S. Cl. 71—105 **28 Claims**

1. A compound represented by Formula I:



(I)

wherein:

X is nitro (—NO_2), a halogen, or cyano (—CN);

Y is hydrogen or chlorine (Cl);

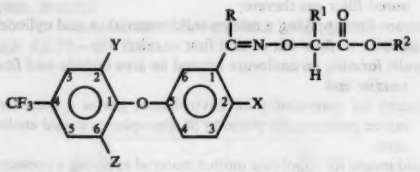
Z is chlorine when Y is chlorine or Z is hydrogen when Y is chlorine or hydrogen;

R is hydrogen or an alkyl of up to three carbon atoms;

R^1 is hydrogen or methyl; and

R^2 is hydrogen, an alkyl of up to ten carbon atoms, or an agronomically soluble salt ion.

15. A method of controlling weeds which comprises contacting the weeds with a herbicidally effective amount of a compound represented by Formula I:



(I)

wherein:

X is nitro (—NO_2), a halogen, or cyano (—CN);

Y is hydrogen or chlorine (Cl);

Z is chlorine when Y is chlorine or Z is hydrogen when Y is chlorine or hydrogen;

R is hydrogen or an alkyl of up to three carbon atoms;

R^1 is hydrogen or methyl; and

R^2 is hydrogen, an alkyl of up to ten carbon atoms, or an agronomically soluble salt ion.

4,344,790

CARBAMINIC ACID ESTERS WITH HERBICIDAL PROPERTIES

Gerhard Boroschewski; Ludwig Nüsslein, and Friedrich Arndt, all of Berlin, Fed. Rep. of Germany, assignors to Schering AG, Berlin and Bergkamen, Fed. Rep. of Germany

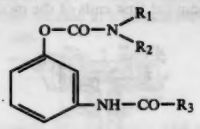
Filed Oct. 23, 1979, Ser. No. 87,637

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1978, 2844806

Int. Cl.³ A01N *37/44;* **C07C** *125/06*

U.S. Cl. 71—111 **10 Claims**

1. A compound of the formula:



wherein

R_1 is di-C_1–C_2-alkoxy-C_1–C_2-alkyl;

R_2 is phenyl optionally mono- or di-substituted by one or more substituents selected from the group consisting of halogen, methyl and methoxy; and

R_3 is C_1–C_8 alkyl, C_2–C_8-alkenyl, cyclopropyl or trichloromethyl.

9. A herbicidal composition containing a herbicidally effective amount of at least one compound as described in claim **1**, further comprising carrier material.

10. A composition as defined in claim **9**, further comprising other additives.

4,344,791

MANUFACTURE OF ACICULAR FERROMAGNETIC IRON PARTICLES

Werner Steck, Mutterstadt; Wilhelm Sarnecki, Limburgerhof; Laszlo Marosi, Ludwigshafen; Manfred Ohlinger, Frankenthal, and Werner Loeser, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 31, 1980, Ser. No. 174,267

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1979, 2935358

Int. Cl.³ C22B *5/12;* **C22C** *1/04*

U.S. Cl. 75—0.5 AA **2 Claims**

1. A process for the manufacture of acicular ferromagnetic iron particles which comprises: coating the surface of acicular particles of iron (III) oxide hydroxide and consisting essentially of goethite with (1) a mixture of an alkaline earth metal compound and a monobasic, dibasic or tribasic aliphatic carboxylic acid of up to 6 carbon atoms, (2) an alkaline earth metal compound and an organic compound which contains two or more groups which can form chelates of the alkaline earth metal cation or (3) an hydrolysis-resistant substance consisting essentially of a phosphorus oxyacid, its ester or its inorganic salt and an aliphatic mono-, di- or tribasic carboxylic acid of 1 to 6 carbon atoms; heating the coated particles at a temperature of from 250° to 450° C. for a period of from 10 minutes to 10 hours in an atmosphere containing water vapor at a partial pressure of from 30 to 1013 mbar; and thereafter heating the particles in the presence of hydrogen at temperatures of from 275° to 425° C. to reduce the particles and thus form acicular ferromagnetic iron particles, whereby the coercivity of the treated particles is higher than the coercivity of the particles prepared by the above process absent said heating of the coated particles in the water vapor containing atmosphere.

4,344,792

REDUCTION SMELTING PROCESS

Charles E. O'Neill, Mississauga, Canada, assignor to Inco Ltd., Toronto, Canada

Filed Feb. 26, 1981, Ser. No. 238,585

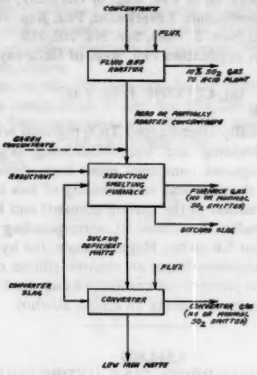
Claims priority, application Canada, Feb. 28, 1980, 346622

Int. Cl.³ C22B *1/10, 1/11, 5/08*

U.S. Cl. 75—9 **9 Claims**

1. A process for recovering base metal values from sulfide concentrates containing iron sulfide and at least one base metal sulfide value from the group consisting of nickel, copper and cobalt which comprises the successive steps of roasting to provide a calcine of reduced sulfur content and a gas having a sulfur dioxide content permitting fixing of sulfur therefrom as sulfuric acid, reduction smelting of the resulting calcine to a

matte containing metallic iron and having a sulfur deficiency with respect to the stoichiometric sulfides Ni_3S_2, Co_9S_8 and



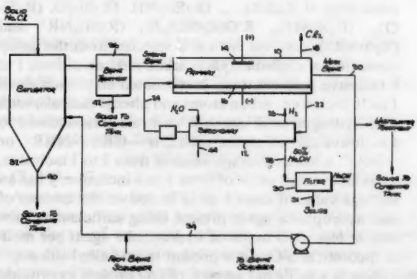
Cu_2S of up to 25%, and then oxidizing and slagging off substantially all of the iron content of the matte with essentially no release of sulfur dioxide during said iron oxidation.

4,344,793

MERCURY REMOVAL PROCESS AND APPARATUS

Ronald J. Burkett, and Luther L. Dunn, both of Westfield, N.J., assignors to Linden Chemicals & Plastics, Inc., Edison, N.J.

Filed Jun. 3, 1980, Ser. No. 156,217
Int. Cl.³ C22B *43/00*
U.S. Cl. 75—81 7 Claims



1. An apparatus for removing mercury and mercury compounds from a material in the form of a sludge or slurry, comprising a filter for removing liquid from the material; drying means, having an inlet for receiving the material from the filter, for further reducing the quantity of liquid in said material to a relative weight of about 5%; muffle oven means for roasting the dried material to raise its temperature to a level sufficient to vaporize the mercury; and a quench tower coupled to a vapor outlet of said muffle oven for receiving said vaporized mercury for recovery and

4,344,794

SOLDER ALLOY FOR THE DIRECT SOLDERING OF OXIDE CONTAINING SILVER CATALYST ON CATALYST CARRIER

Andreas Szulczyk, Linsengericht, Fed. Rep. of Germany, assignor to Degussa AG, Frankfurt, Fed. Rep. of Germany

Filed Dec. 1, 1980, Ser. No. 211,940
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1979, 2948915
Int. Cl.³ C22C *5/08*
U.S. Cl. 75—173 C 4 Claims

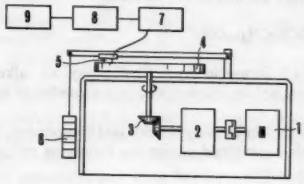
1. A phosphorus free soldering alloy suitable for the direct soldering of an electrical contact of silver containing at least one metal oxide to a contact carrier consisting essentially of a silver-copper alloy consisting of (1) 53% Ag, 21% Cu, 25.8% Cd and 0.2% Li, or (2) 30% Ag, 33% Cu and 37% Cd, or (3) 60% Ag, 27% Cu and 13% In.

4,344,795

IRON-BASED SINTERED SLIDING PRODUCT

Hiroyuki Endo, Abiko, and Yutaka Ikenoue, Matsudo, both of Japan, assignors to Hitachi Powdered Metals Company, Ltd., Matsudo, Japan

Filed Feb. 20, 1980, Ser. No. 123,088
Claims priority, application Japan, Nov. 15, 1979, 54-147020
Int. Cl.³ B22F *3/00, 5/00*
U.S. Cl. 75—230 11 Claims



1. An iron-based sintered sliding product, wherein 0.1 weight % to 3 weight % free graphite and Fe - P - C ternary alloy phase having a hardness of MHv 300 to 850 and having an area ratio of 3% to 20% are dispersed in an iron-based matrix containing either from 0.1 weight % to 1 weight % Sn or 0.1 weight % to 1 weight % Zn, and 1 weight % to 10 weight % Cu and 0.3 weight % to 1 weight % C.

4,344,796

CEMENTITIOUS COMPOSITIONS AND AGGREGATE DERIVATIVES FROM SAID COMPOSITIONS

L. John Minnick, Box 271, Plymouth Meeting, Pa. 19462, assignor to L. John Minnick, Plymouth Meeting, Pa.

Division of Ser. No. 50,206, Jun. 20, 1979, Pat. No. 4,250,134.
This application Nov. 17, 1980, Ser. No. 207,273
Int. Cl.³ C04B *19/04*
U.S. Cl. 106—84 15 Claims

1. Cementitious composition comprising:

(a) the anhydrous spent residue from a fluidized combustion bed of the type wherein limestone particles are suspended in a dry condition in the presence of a carbonaceous fuel in a fluidized medium and wherein the carbonaceous fuel is ignited within said fluidized medium to capture therein substantial amounts of SO_x which is generated upon ignition of said carbonaceous fuel said residue containing coal ash which is substantially free of finely divided siliceous-alumina glass compounds,

(b) water, and

(c) pozzolanic materials.

4,344,797

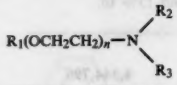
SHAPED ARTICLES MADE FROM EXPANDED MINERALS

Franz J. Voetz, Camberg, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 24, 1981, Ser. No. 237,708
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1980, 3007738
Int. Cl.³ C04B *19/04*
U.S. Cl. 106—84 3 Claims

1. Shaped articles made from expanded minerals, obtained by solidification of a mixture of water glass, catalyst and an expanded mineral pretreated with a hydrophobizing agent which comprises substantially

(a) a fatty amine of the formula



in which R_1 is C_8–C_{22}alkyl or -alkenyl, or C_8–C_{22}-alkylphenyl, R_2 and R_3 each are hydrogen, C_1–C_4-alkyl or -alkenyl, phenyl or benzyl, and n is a number of from 0 to 4;

(b) a fatty acid of the formula

$$R_5CO(OCH_2CH_2)_mOH$$

or a fatty alcohol of the formula

$$R_6(OCH_2CH_2)_mOH$$

in which formulae R_5 is C_8–C_{22}alkyl or -alkenyl, R_6 is C_9–C_{23}alkyl or -alkenyl, and m is a number of from 0 to 2; and

(c) a low molecular weight acid, said components (a), (b) and (c) being combined within the following range of molar mixing ratios:

from 1 to 10 moles of component (a) for each 1 to 10 moles of component (c) and 0 to 10 moles of component (b).

4,344,798

ORGANIC POLYISOCYANATE-DIALKYL CARBONATE ADHESIVE BINDER COMPOSITIONS

James M. Gaul, Exton, and Tinh Nguyen, Chaddsford, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 17, 1981, Ser. No. 293,563
Int. Cl.³ C08L *97/02*
U.S. Cl. 106—123 LC 28 Claims

1. An adhesive binder composition for the preparation of compression moldable lignocellulosic articles which comprises from about 20 to 95 percent by weight of an organic di- or polyisocyanate and from about 5 to 80 percent by weight of a liquid dialkyl carbonate having from 3 to 11 carbon atoms.

11. A compression moldable lignocellulosic composition comprising lignocellulosic particles and from about 1.5 to 12 percent by weight based on oven dried particles of an adhesive binder composition which comprises from about 20 to 95 weight percent organic di- or polyisocyanate and from about 5 to 80 weight percent liquid dialkyl carbonate having from 3 to 11 carbon atoms.

22. A composition board product comprising a compression molded lignocellulosic composition comprising lignocellulosic particles and from about 1.5 to 12weight percent based on oven dried lignocellulosic particles employed of an adhesive binder composition, said binder composition being a mixture of from about 20 to 95 weight percent organic di- or polyisocyanate and from 5 to 80 weight percent liquid dialkyl carbonate having from 3 to 11 carbon atoms.

4,344,799

READILY DISPERSIBLE TiO_2 PIGMENT

Klaus Köhler; Peter Woditsch; Hilmar Rieck, all of Krefeld, and Fritz Rodi, Moers, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 3, 1980, Ser. No. 203,010
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1979, 2946549
Int. Cl.³ C09C *1/32, 3/00*
U.S. Cl. 106—300 6 Claims

1. An inorganically after-treated TiO_2 pigment with a coating of hyrophobicizing and hydrophilicizing organic substances, which pigment comprises more than about 95% by weight of TiO_2, shows a loss on annealing of less than about 0.8% (after subtraction of the carbon content) and has a grindometer value smaller than about 30, corresponding to a value of more than about 5.6 on the Hegman scale, the hydrophobicizing organic substance being an organic silicon compound and/or an organic phosphorus compound and the hydrophilicizing organic compound being an amino alcohol.

4,344,800

METHOD FOR PRODUCING HYDROPHOBIC REINFORCING SILICA FILLERS AND FILLERS OBTAINED THEREBY

Michael A. Lutz, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jun. 3, 1980, Ser. No. 156,002
Int. Cl.³ C04B *31/40;* C09C *1/28, 3/12*
U.S. Cl. 106—308 Q 84 Claims

1. A method for the production of a composition containing a reinforcing silica filler for silicone rubber which comprises the steps of

(I) mixing the following in the presence of a sufficient amount of at least one basic catalyst to render the mixture alkaline:

(A) at least one alkyl silicate selected from the group consisting of methyl orthosilicate, ethyl orthosilicate, methyl polysilicate and ethyl polysilicate wherein said alkyl silicate contains alkoxy radicals,

(B) an amount of water equal to at least 70 percent of one-half of the stoichiometric amount of water required to completely hydrolyze the alkoxy radicals present in said alkyl silicate,

(C) at least one alcohol selected from the group consisting of methanol, ethanol, n-propanol and isopropanol, and

(D) at least one hydrophobe agent selected from the group consisting of R_nSiZ_{4-n}, $(R_3Si)_2NH$, $(R_3Si)_2O$, $(R_2SiO)_x$, $(R_2SiNH)_x$, $R'O(R_2SiO)_yR'$, $(R_3Si)_2NR''$ and $(R_2SiNR'')_x$ wherein each R is selected from the group consisting of aliphatic hydrocarbon radicals of from 1 to 6 inclusive carbon atoms, halogenated alkyl radicals of 1 to 10 inclusive carbon atoms and phenyl radicals, each R′ is hydrogen or R″, each R″ is an alkyl radical of 1 to 4 inclusive carbon atoms, each Z is —OR′, —NHR″, or —NR_2″, n has an average value of from 2 to 3 inclusive, x has an average value of from 3 to 6 inclusive, y has an average value of from 1 to 12 inclusive, the amount of said hydrophobe agent present being sufficient to provide at least 0.05 moles of hydrophobe agent per mole of theoretical SiO_2 units present in said alkyl silicate,

wherein there is a sufficient amount of (A) present to provide at least 3 parts by weight of theoretical SiO_2 units per 100 parts by weight of (A), (B), (C) and any basic catalyst not derived from (D) and wherein the order of mixing is such that (D) is added prior to the occurrence of any gelation of the composition formed upon mixing, and

(II) aging the mixture formed in (I) for a sufficient amount of time to result in a composition containing a hydrophobic reinforcing silica filler for silicone rubber.

43. A composition containing a hydrophobic reinforcing silica filler for silicone rubber obtained in accordance with the method of claim 1.

4,344,801

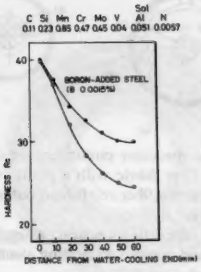
HEAVY THICK HIGH-STRENGTH CASTING HAVING IMPROVED WELDABILITY AND IMPACT PROPERTIES

Tatsuro Kunitake; Hiroo Ohtani; Seiichi Watanabe, all of Amagasaki; Toshiji Takigawa, and Yoshiro Matsumoto, both of Osaka, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 109,911, Jan. 7, 1980, abandoned, which is a continuation of Ser. No. 914,225, Jun. 9, 1978, abandoned. This application Feb. 20, 1981, Ser. No. 236,312

Int. Cl.³ C21D *9/00*

U.S. Cl. 148—3 2 Claims


C Si Mn Cr Mo V Sol Al N
0.11 0.23 0.85 0.47 0.45 0.04 0.051 0.0057
BORON-ADDED STEEL (B 0.0015%)
HARDNESS Rc
40
30
20
0 10 20 30 40 50 60
DISTANCE FROM WATER-COOLING END(mm)

1. A method of manufacturing a heavy, thick, high-strength steel casting having a tensile strength of at least 80 kg/mm², a vEo value of at least 8 kg-m/cm², a Ceq value of 0.40 to 0.53% for a maximum wall thickness of 50 mm, a Ceq value of 0.50 to 0.63% for a maximum wall thickness of up to 150 mm, and improved weldability, said method comprising the steps of (a) casting a molten steel consisting of 0.07 to 0.20% carbon, 0.01 to 0.60% silicon, 0.50 to 2.00% manganese, 0.03 or less phosphorus, 0.03% or less sulfur, 0.15 to 0.90% molybdenum, 0.01 to 0.10% vanadium, 0.04 to 0.15% sol. aluminum, 0.0005 to 0.0030% boron and 0.002 to 0.015% nitrogen, the remainder being iron, (b) cooling and solidfying the casting, (c) heating the solidified casting to a temperature of 930° C. to 1050° C. for at least one hour, (c) cooling the casting in air, (e) heating the casting to 850° C. to 930° C. for at least one half hour so as to harden the casting, and (f) subjecting the casting to a temperature of 580° C. to 670° C. for at least one hour to temper the casting.

4,344,802

STABLE SLURRY OF INACTIVE MAGNESIA AND METHOD THEREFOR

Michael H. Haseikorn, Carlisle, Ohio, assignor to Armco Inc., Middletown, Ohio

Continuation of Ser. No. 821,595, Aug. 4, 1977, abandoned. This application Dec. 8, 1978, Ser. No. 967,725

Int. Cl.³ B23K *35/24*

U.S. Cl. 148—27 18 Claims

1. A composition for forming an insulative glass film on oriented silicon steel strip and sheet surfaces, comprising an aqueous slurry of magnesia, at least 25% of said magnesia having a citric acid activity greater than 200 seconds, a phosphate-containing compound chosen from the group consisting of calcium phosphates, water soluble ammonium polyphosphate, aluminum phosphate, magnesium phosphates, phosphoric acid, and mixtures thereof, said compound being present within the range of 2% to 25% by weight calculated as P_2O_5, based on the weight of magnesia, and balance essentially water, the magnesia concentration being up to 0.6 gram per cubic centimeter of slurry, said slurry being stable against settling for periods of time up to 10 hours.

10. The method of suspending in water a magnesia at least 25% of which consists of magnesia having a citric acid activity greater than 200 seconds to produce a slurry having increased viscosity and stability against settling, which comprises the step of providing in said slurry a phosphate-containing compound chosen from the group consisting of calcium phosphates, water soluble ammonium polyphosphate, aluminum phosphate, magnesium phosphates, phosphoric acid, and mixtures thereof, said compound being present within the range of 2% to 25% by weight calculated as P_2O_5, based on the weight of magnesia.

4,344,803

PHOTO CATHODE MADE FROM COMPOSITE SEMICONDUCTOR/GLASS MATERIAL

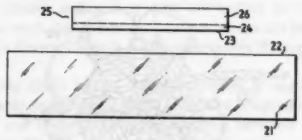
Erich Kasper, Senden, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 13, 1980, Ser. No. 130,124

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1979, 2909956

Int. Cl.³ H01L *29/36, 31/00*

U.S. Cl. 148—33.3 6 Claims



1. A photocathode comprising: a plate-shaped glass substrate; a semiconductor layer having opposed first and second major surfaces with said first major surface being planar and permanently bonded to a surface of said glass substrate through the use of pressure and increased temperature, said semiconductor layer consisting of semiconductor material of a single conductivity type and having a first layer region extending along the entire said second major surface with a homogeneous doping concentration $N=N_o$ and with the remaining portion of said semiconductor layer having a doping concentration which continuously increases with decreasing distance from said first major surface, in a direction normal to same, from said value of $N=N_o$ up to a value of $N=N_s$ at said first major surface, where $N_s>30\ N_o$.

4,344,804

PROCESS AND APPARATUS FOR THE MANUFACTURE OF FIBER-REINFORCED HYDRAULICALLY BOUND ARTICLES SUCH AS CEMENTITIOUS ARTICLES

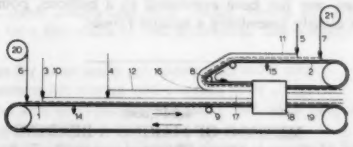
Jan M. J. M. Bijen, Munstergeleen, and Johann J. Jansen, Nieuwstadt, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Nov. 21, 1979, Ser. No. 96,477

Claims priority, application Netherlands, Nov. 21, 1978, 7811434

Int. Cl.³ B28B *1/30, 3/12, 5/02;* B32B *13/02*

U.S. Cl. 156—42 22 Claims



1. A process for manufacturing articles comprised of fiber-reinforced, hydraulically bound materials comprising the steps of forming a first layer by incorporating a hydraulically bindable material into a plurality of continuous plastic networks on a first conveyer, said continuous plastic networks being comprised of a composition of coherent fibers or filaments,

stretched and fibrillated plastic films or perforated sheets of films, continuously forming a second layer by incorporating, a hydraulically bindable material into a plurality of continuous plastic networks on a second conveyor, removing a predetermined quantity of water from each layer and subsequently forming a composite layer structure by depositing the layer formed on one of the conveyors onto the layer formed on the other conveyor so that the one deposited is turned upside down and finishing the article.

4,344,805

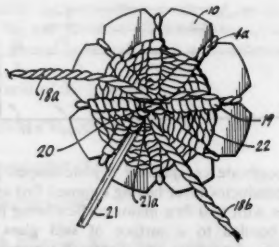
ARTIFICIAL FLOWER MAKING TEMPLATE AND METHOD

Suzanne M. Warde, 424 Ninth Ave., Lindenwold, N.J. 08021

Division of Ser. No. 131,054, Mar. 17, 1980, abandoned. This application Apr. 24, 1981, Ser. No. 257,399

Int. Cl.³ A41G *1/00*

U.S. Cl. 156—61 **3 Claims**



1. A method of fashioning artificial flowers from yarn or twine comprising providing an essentially circular template of flat, rigid material having six or other even number of notches equally spaced circumferentially thereof, providing a unitary strand of yarn or twine having a length at least sufficient to complete the formation of a planned artificial flower, wrapping said strand, with a short starting end supported at the geometric center of one, working side of the template, around said template with rotation of the template to provide strand spokes entwined around said starting end of the working side of the template and crossing each other at the center of the reverse side, then spirally lacing said strand around the spokes at said working side by passing the strand under two spokes, back over the second, under it and the next, back over said next and under two, etc., until six or more complete spirals have been completed, then, after looping the strand around the last strand spoke, tieing it at the geometric center of the template to said starting end to a deformable stem-forming member, then cutting the crossed strand spokes centrally of the reverse side of the template, bringing the cut ends around to and joining the stem-forming member in a manner to bring edges of the spirally woven mat as close as possible to the stem forming member, and wrapping together said cut ends and stem forming member to provide a permanent assemblage wherein the woven mat has been converted to a bulbous, pom-pon-like mass closely resembling a natural flower.

4,344,806

METHOD OF MAKING A BEARING

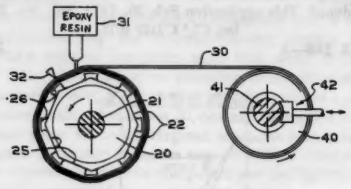
James H. Kramer, Akron, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Mar. 23, 1981, Ser. No. 246,561

Int. Cl.³ B29C *25/00*; B29H *7/00*; B65H *81/00*

U.S. Cl. 156—154 **9 Claims**

1. A method of fabricating a bearing assembly comprising the steps of building a flat rectangular sheet of plies of fabric reinforced with an elastomer; abutting a plurality of strips of elastomer in a laterally spaced relationship to said flat sheet; vulcanizing said strips and said flat sheet into an integral unit; wrapping said flat sheet into a circumferential hoop around a mandrel with the laterally spaced strips on the inner periphery and abutting said mandrel in a circumferentially spaced relationship; simultaneously rotating said mandrel while wrapping



a fiber fabric onto the outer circumference of said hoop and impregnating the fiber fabric with a plastic resin; and curing said resin to complete a fiber reinforced outer shell to provide a bearing assembly.

2. A method of fabricating a bearing assembly as set forth in claim 1 wherein said completed bearing assembly is machined to a predetermined diameter.

4,344,807

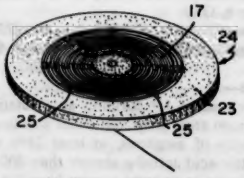
SPIRAL WINDING OF FILAMENTS

Joseph C. Dennesen, 62 Bridge St., Beverly, Mass. 01915, and Francis G. Dennesen, 16 Long Bow Cir., Lynnfield, Mass. 01940

Filed Oct. 23, 1978, Ser. No. 953,912

Int. Cl.³ B32B *31/00*; H04R *19/00*

U.S. Cl. 156—155 **13 Claims**



1. A method for spiral winding a filament comprising, contacting a leading portion of said filament with a portion of a spiral-wound groove impressed in a surface of a winding member, pressing or directing said filament into said groove by means of a guide member while said winding member is rotated, to wind said filament into a spiral winding on said winding member, releasably holding said spiral winding in said groove, contacting said spiral winding with bonding material on a backer member to form a spirally wound element and removing said element from the winding member.

4,344,808

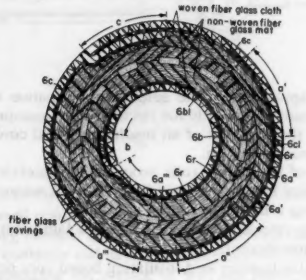
METHOD FOR MANUFACTURING SYNTHETIC RESIN LAMINATE TUBING HAVING A HIGH BURSTING STRENGTH

Daniel P. Healey, Jr., 6 Middle Rd., Merrimacport, Mass. 01860, and Delbert L. George, 1708 Bayshore Dr., Englewood, Fla. 33533

Continuation of Ser. No. 659,334, Feb. 19, 1976, abandoned, which is a division of Ser. No. 579,972, May 22, 1975, Pat. No. 3,979,709. This application Dec. 8, 1977, Ser. No. 858,811

Int. Cl.[2] B29D *23/10*

U.S. Cl. 156—166 1 Claim



1. A method of manufacturing electric fuse casings by the pultrusion process including the steps of

(a) wrapping a first composite strip consisting of woven glass fiber cloth having a coextensive liner of non-woven fiber mat material around a mandrel in such a way that said woven glass fiber cloth is on the inside and said liner on the outside, and that the edge regions of said first strip overlap in a direction longitudinally of said mandrel;

(b) wrapping at least one second strip of non-woven glass mat having non-uniformly oriented fibers around said first strip in such a way that the longitudinal edges of said second strip overlap in a direction longitudinally of said mandrel;

(c) depositing a plurality of spaced glass fiber rovings in squirrel cage-like fashion around said mandrel and over said second strip in a direction longitudinally of said mandrel;

(d) wrapping at least one third strip of non-woven glass-mat having non-uniformly oriented fibers around said mandrel and over said rovings in such a way that the longitudinal edges of said third strip overlap in a direction longitudinally of said mandrel;

(e) wrapping a fourth strip consisting of woven glass fiber cloth having a coextensive liner of non-woven fiber mat material around said mandrel in such a way that said woven glass fiber cloth is on the outside and said liner is on the inside and that said edge regions of said fourth strip overlap in a direction longitudinally of said mandrel;

(f) jointly expanding said first strip, said second strip, said rovings, said third strip, and said fourth strip on said mandrel by transferring the same from a region of relatively small diameter to a region of relatively large diameter; and

(g) establishing a flow of liquid thermosetting synthetic resin inside said mandrel in a direction longitudinally thereof and allowing said thermosetting synthetic resin to escape from said mandrel in a direction substantially transversely of said mandrel at a point thereof where said first strip, said second strip, said rovings, said third strip, and said fourth strip have been jointly expanded whereupon the same are then jointly impregnated with synthetic resin.

4,344,809

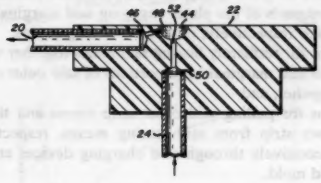
JET ETCH APPARATUS FOR DECAPSULATION OF MOLDED DEVICES

Ben L. Wensink, 1236 Lisa La., Los Altos, Calif. 94022

Filed Sep. 29, 1980, Ser. No. 192,076

Int. Cl.[3] B44C *1/22;* C03C *15/00, 25/06;* B41C *1/00*

U.S. Cl. 156—345 9 Claims



1. A jet etch apparatus comprising:

suction means and a first tube connected to the suction means such that when the suction means are in operation fluid is drawn towards the suction means through said first tube;

an etching block having a shallow recess at one surface, an exit hole extending to said recess and coupled to said first tube, and an intake portal extending between said recess and the exterior of the etching block; and

an etchant vessel for holding an etchant solution and including a second tube running from said etchant solution to said intake hole of the etching block.

4,344,810

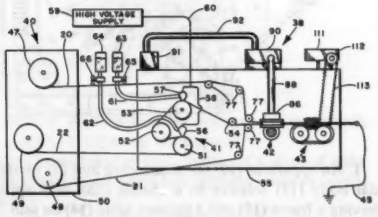
APPARATUS FOR MAKING TAPE TRANSDUCER

Jon Becker, Milpitas; G. Kirby Miller, Saratoga, and Charles F. Burney, Orland, all of Calif., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 16, 1981, Ser. No. 244,491

Int. Cl.[3] H01S *4/00*

U.S. Cl. 156—379.7 12 Claims



1. A machine for making a composite tape transducer, said transducer comprising an inner conductive strip having dielectric layers bonded to and covering opposite sides thereof, a pair of outer conductive strip means having equal widths greater than the width of said inner strip, said machine comprising

means for electrically grounding said inner strip,

first means for storing said covered inner strip,

second and third means for storing said outer strip means, respectively,

a pair of substantially identical electrical charging devices, each of said devices having electrode means adapted to be connected to a source of DC voltage,

means for directing said covered inner strip successively through said charging devices with said dielectric layers in operative contact with said electrode means, respectively, whereby to electrically charge said layers,

a mold having a pair of juxtaposed plates, at least one of said plates having a recess with a width not less than the width of the inner strip,

means for directing said outer strip means towards and generally symmetrical to opposite sides, respectively, of said inner strip and between said mold plates, said outer strip means having marginal edge portions extending beyond the side edges, respectively, of the inner strip, said inner strip being aligned with said plate recess with adjacent parts of the plates engaging said marginal edge portions, respectively, of said outer strip means,

means for resiliently biasing said plates together whereby to seal said marginal edge portions of said outer strip means together, and

means for pulling said outer strip means and the covered inner strip from said storing means, respectively, and successively through said charging devices and through said mold.

2. The machine according to claim 1 with

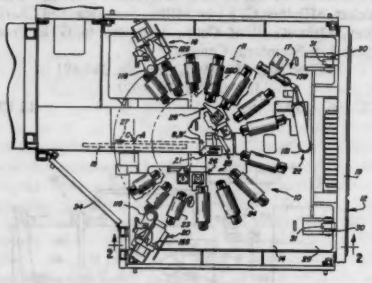
means to heat said outer strips and said plates whereby to heat seal said marginal edge portions of said outer strips together.

4,344,811

BODY POSITIONING AND DRIVING APPARATUS

James E. Carney, Santa Cruz, Calif., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 14, 1980, Ser. No. 262,073
Int. Cl.³ B29H *17/32*
U.S. Cl. 156—397 **21 Claims**



1. An apparatus (10) for positioning and for rotating a toroidal body (11) relative to a shuttle (15), said apparatus (10) having a frame (19) and a support table (14) on said frame (19), the shuttle (15) being carried by said frame (19) and rotatable in a plane lying substantially transverse to said support table (14), comprising:

carrier roller means (23,24) for supporting a toroidal body (11) for rotation relative to said support table (14) about a rotational axis (B,B') of the toroidal body (11); said carrier roller means (23,24) being mounted on said support table (14) and having longitudinal axes radiating generally from said rotational axis (B,B');

means (17) for locating the rotational axis (B,B') of the toroidal body (11) relative to a rotational center (A) of said shuttle (15) and for centering a cross section of the toroidal body (11) within the shuttle (15);

means (22) for rotating the toroidal body (11) through the shuttle (15); and

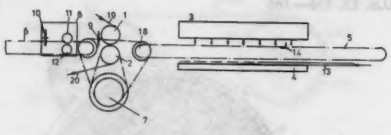
means (106,125,159) for selectively moving said locating means (17) between a plurality of positions accommodating toroidal bodies of different diameters.

4,344,812

DEVICE FOR THE LAMINATION OF INSULATING BOARDS

Erika de Masi, Zeisigweg 44, D 6072 Dreieich, Fed. Rep. of Germany

Filed Sep. 2, 1980, Ser. No. 183,446
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1979, 2935418
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—499 **11 Claims**



1. An apparatus for the automatic lamination of copper-coated insulating boards for circuit boards comprising:

means for transport of an insulating board core toward a laminating station;

a pair of laminating rolls arranged for receiving said insulating board from said first transport means and comprising a laminating station;

a motor operatively attached to said laminating rolls for rotation thereof;

means for heating said insulating board core prior to passage through said laminating rolls;

means for transport of a laminated insulating board away from said laminating rolls operatively attached to said motor;

a cutting blade operatively disposed in a cutting beam and moveable in the direction transverse to the laminated insulating board;

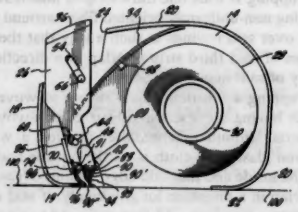
a friction clutch operatively attached to said motor and said cutting beams for synchronized movement and cutting of said laminated insulating board.

4,344,813

TAPE DISPENSER

Manning Holoff, Los Angeles, and James D. Riggins, N. Hollywood, both of Calif., assignors to Manning Holoff Co., Van Nuys, Calif.

Filed Dec. 15, 1980, Ser. No. 216,083
Int. Cl.³ B32B *31/18*; B44C *7/00*
U.S. Cl. 156—527 **13 Claims**

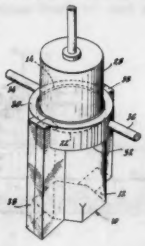


4. A pressure sensitive tape dispenser comprising a housing, means for mounting a roll of pressure sensitive tape within said housing, a tape cutting member disposed within said housing, a manually operative applicator element slidably mounted within said housing, a tape support bar carried by said applicator element, a tape gripping member defining a tape gripping bar, said tape gripping member being mounted for pivotal and limited linear movement on said applicator element such that said tape gripping bar is disposed forwardly and substantially parallel with said tape support bar, biasing means for urging said applicator element upwardly within said housing, and guide means for directing said tape gripping bar from said tape

4,344,814
APPARATUS FOR HEAT SEALING ROUND CONTAINERS

Edwin C. McLaren, Apple Valley, Minn., assignor to Champion International Corporation, Stamford, Conn.

Division of Ser. No. 108,034, Dec. 28, 1979, Pat. No. 4,305,771.
This application Sep. 22, 1981, Ser. No. 304,590
Int. Cl.³ B32B *31/20, 1/08*
U.S. Cl. 156—581 1 Claim



1. Apparatus for sealing together a multi-piece circular rim in a tub shaped container, comprising:

a male plug member adapted to be inserted into the interior of said container and having surface portions for conformingly engaging the surface of said rim inside said container; and

a heated press assembly including:

(1) a multi-piece, annularly shaped, shiftably mounted collar having surface areas adapted to surround the entire periphery of said rim and adapted to conformingly engage the exterior surface of said rim, at least certain of the pieces of said multi-piece collar being shiftable from a standby position spaced from said rim to an operated position in engagement with said rim, and

(2) electrical heating means carried by each of said pieces of said multi-piece collar and adapted to be coupled with a source of thermal energy,

said plug member, said collar and heating means cooperating to apply heat evenly around the entire periphery of said rim when said collar is shifted to said operated position thereof.

4,344,815
METHOD FOR CHARACTERIZING THE OXYGEN CONTENTS OF CZOCHRALSKI GROWN SILICON RODS

Victor Cazarra; Andre Schwab, both of Mennecy, and Patrick Zunino, Evry, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 9, 1980, Ser. No. 158,003
Claims priority, application France, Jun. 29, 1979, 79 17302
Int. Cl.³ C30B *15/00*
U.S. Cl. 156—601 12 Claims

1. A method for characterizing the oxygen content of a Czochralski grown silicon rod which is to be cut into wafers, comprising the following steps:

(A) stabilizing the rod by heating;

(B) cutting a first portion of the rod close to a first end of the rod and measuring its resistivity;

(C) annealing said portion in a neutral atmosphere at a temperature in the range of approximately 600° to 900° C. for a period of time sufficient to generate donors; and

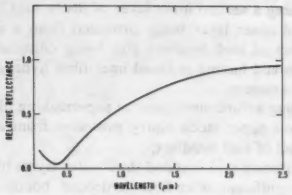
(D) cleaning said portion and measuring the resistivity increment to characterize the oxygen concentration from the resistivity increment.

wherein said first end is the rod head and, if the resistivity increment is lower than the critical value corresponding to a significant donor generation, the remaining portion of the rod is selected to be used on bipolar device production lines.

4,344,816
SELECTIVELY ETCHED BODIES

Harold G. Craighead, Fair Haven; Richard E. Howard, Holmdel, and Donald M. Tennant, Freehold, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 19, 1980, Ser. No. 218,089
Int. Cl.³ C23F *1/02*
U.S. Cl. 156—643 12 Claims

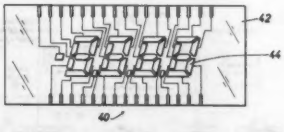


1. A process for producing an article comprising the steps of forming a mask on the surface of a substrate and etching said substrate by anisotropic etching characterized in that said mask is formed by depositing onto said substrate a material that does not substantially wet said surface of said substrate, and wherein said etching produces a ratio of vertical etch rates of said substrate to said mask of greater than 1.

4,344,817
PROCESS FOR FORMING TIN OXIDE CONDUCTIVE PATTERN

Rhodes R. Chamberlin, El Paso, Tex., assignor to Photon Power, Inc., El Paso, Tex.

Filed Sep. 15, 1980, Ser. No. 186,855
Int. Cl.³ C03C *17/10*
U.S. Cl. 156—645 18 Claims



1. A method of manufacture for transparent electrically conductive circuits, comprising the steps of:

forming on a transparent vitreous substrate a layer of polycrystalline material having a first selected range of crystal diameters,

selectively removing portions of said polycrystalline material to define a first desired pattern,

forming a layer of transparent electrically conductive material over an area containing at least said desired pattern, and

removing remaining portions of said polycrystalline material and overlying portions of said transparent conductive material therewith, wherein remaining portions of said transparent electrically conductive material define a first circuit.

support bar as said applicator element is moved downwardly within said housing thereby allowing tape to be withdrawn from said housing and, upon said applicator element being raised by said biasing means, for directing said tape suppport bar against said gripping bar for gripping said tape therebetween and pulling said tape over said cutting member thereby severing said tape from the tape roll.

4,344,818

AIR/WATER HYBRID FORMER

David A. Nuttall, and Sung H. Hong, both of Neenah, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 4, 1981, Ser. No. 259,962
Int. Cl.³ D21H 5/24
U.S. Cl. 162—111 6 Claims

1. A method of forming a multi-layer absorbent web from a single headbox comprising:

(a) forming a first outer layer of papermaking fibers from an aqueous fiber stock slurry provided from a first flow channel of said headbox;

(b) forming a second inner layer of fibers, said fibers in said second inner layer being provided from a second flow channel of said headbox and being entrained in an air stream and having reduced inter-fiber hydrogen bonding therebetween;

(c) forming a third outer layer of papermaking fibers from an aqueous paper stock slurry provided from a third flow channel of said headbox;

(d) dewatering said first and third outer layers of fibers such that significant inter-fiber hydrogen bonds are formed between fibers within each of said first and third layers; and

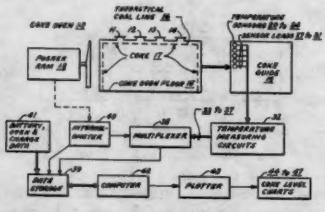
(e) creping at least one of said first or third outer layers of fibers.

4,344,819

METHOD OF DETERMINING COKE LEVEL

John H. Gerdes, Jr., Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jun. 23, 1980, Ser. No. 161,845
Int. Cl.³ C10B 35/00; G01K 7/00
U.S. Cl. 201—1 8 Claims



1. A method of determining batch-processed coke level during a cycle of pushing hot coke from an oven through a coke guide, which method comprises:

(a) measuring coke vertical temperature profile data by sensing plural coke temperatures at plural coke guide levels during lengthwise pushing of the coke, said levels being within an expected coke height range referenced to a coke oven floor;

(b) storing in a data matrix plural coke vertical temperature profile data sets with each set measured at a different one of plural intervals related to the coke oven push;

(c) determining observed coke level data at each of said intervals by detecting the highest level at which a temperature sensor was activated by coke in each stored coke vertical temperature profile data set; and

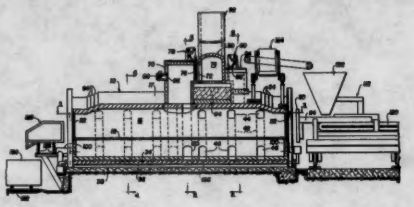
(d) utilizing the determined coke level data to represent hot coke level existent in the coke oven before the pushing cycle.

4,344,820

METHOD OF OPERATION OF HIGH-SPEED COKE OVEN BATTERY

Buster R. Thompson, Louisville, Tenn., assignor to Elk River Resources, Inc., Knoxville, Tenn.

Division of Ser. No. 918,054, Jun. 22, 1980, Pat. No. 4,287,024.
This application Dec. 19, 1980, Ser. No. 218,258
The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.
Int. Cl.³ C10B 21/20, 27/04, 31/08
U.S. Cl. 201—15 10 Claims



1. In a non-recovery coking operation in which coal is coked in a plurality of individual ovens constructed in side-by-side relation in a battery, the ovens each having an elongated coking chamber with oven doors normally closing the opposed ends of the chamber and a system of sole flues extending beneath the floor and connected with the chamber for burning gases produced during the coking process to supply heat to the chamber, the method of controlling charging gas emissions during charging of the individual ovens comprising,

providing an elongated exhaust gas tunnel connected with the sole flues of each of a plurality of such ovens and simultaneously exhausting hot flue gases from the sole flues of said plurality of ovens into the exhaust gas tunnel,

providing a closeable gas flow bypass between the top portion of the respective coking chambers and the elongated exhaust gas tunnel,

removing one door only and opening the gas flow bypass from the oven to be charged and charging the oven with coal through the removed door while maintaining the gas flow bypass oven,

closing the coking chamber by replacing the removed oven door after the coal has been charged into the chamber, and

closing the gas flow bypass after the oven has been charged and closed, whereby gases and emissions evolved in the coking chamber flow through the gas flow bypass directly into the elongated exhaust gas tunnel to be mixed with and burned by hot flue gases exhausted from the sole flues of other ovens in the battery only during the charging operation.

4,344,821

APPARATUS FOR CONTINUOUSLY CARBONIZING AND ACTIVATING CARBONACEOUS MATERIALS

James F. Angelo, II, P.O. Box 212, Jonesboro, Ark. 72401

Division of Ser. No. 95,366, Nov. 19, 1979, Pat. No. 4,273,619.
This application Dec. 5, 1980, Ser. No. 213,564
Int. Cl.³ C10B 1/10
U.S. Cl. 201—33 3 Claims

1. A process for carbonizing a carbonaceous raw material to reduce it to a char, and for subsequently activating said char to produce activated carbon, both in a continuous operation in a single retort, consisting of the successive steps of:

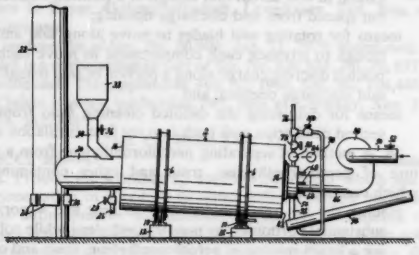
a. introducing said raw material in particulate form into the higher end of an inclined rotary retort, whereby said material is caused by rotation of said retort to advance toward the lower end of said retort in the form of a tumbling bed during processing, and continuously removing the processed material from the lower end of said retort,

b. initially heating said raw material in the upper end zone of

said retort to a temperature sufficient to initiate a self-sustaining carbonization reaction which releases heat and combustible hydrocarbon gases,

c. injecting air into the higher end zone of said retort to burn with said hydrocarbon gases to supply heat for bringing freshly added raw material to carbonization temperature, and so regulating the material and air delivery rates that the carbonization reaction is substantially completed within the higher end zone of the retort,

d. inducing a continuous draft in said retort toward the higher end thereof,



e. pre-heating a non-combustible gaseous oxidizing agent, but not air, exteriorly of said retort to a temperature at least as high as that at which the material of the tumbling bed enters the lower end zone of the retort, and

f. injecting said oxidizing agent into only the lower end zone of the retort, said injection step being performed by directing forcible jets of said oxidizing agent from a position closely adjacent said material bed, directly into said bed, whereby to inhibit free circulation of said agent exteriorly of said bed, and to stir and agitate the bed material to improve heat transfer therebetween.

4,344,822

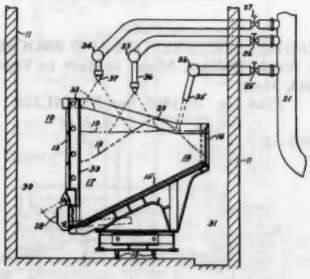
ONE-SPOT CAR COKE QUENCHING METHOD

S. Robert Schwartz, Valparaiso; William E. Swan, Jr.; Robert C. Fetterman, both of Chesterton, all of Ind., and Victor A. Neubaum, deceased, late of Coopersburg, Pa. (by Doris W. Neubaum, administratrix), assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Oct. 31, 1979, Ser. No. 89,847

Int. Cl.³ C10B *39/08, 39/14*

U.S. Cl. 201—39 **5 Claims**



1. A process for quenching hot coke in a substantially watertight one-spot quench car having a sloping bottom which slopes downwardly from the bench side of the quench car to the wharf side of the quench car and provides a shallow coke bed portion and a deep coke bed portion and which is positioned in a quenching station beneath independently operable quench headers mounted substantially parallel to the longitudinal axis of the one-spot quench car and substantially coextensive therewith, the sequential steps comprising:

(a) initiating the projection of spaced apart solid streams of quenching liquid from a first quench header onto the surface of the shallow coke bed portion,

(b) commencing the flow of quenching liquid from a plurality of spray nozzles onto the hot coke after the initiating of the solid streams,

(c) ceasing the projection of spaced apart solid streams of quenching liquid onto the surface of the shallow coke bed portion,

(d) ceasing the flow of quenching liquid from the plurality of spray nozzles,

(e) draining from the watertight one-spot coke quench car the quenching liquid which is allowed to accumulate in the bottom of the quench car, and

(f) discharging the coke from the one-spot coke quench car, whereby coke is provided having an average moisture content of between about 4% and about 10% and a standard deviation from average coke moisture of less than about ±4%.

4,344,823

DISCHARGING METHOD AND APPARATUS FOR DRY COKE COOLING CHAMBERS

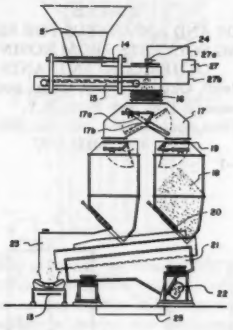
Josef Stratmann, and Klaüs Mrongowiüs, both of Recklinghausen, Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & Co. KG., Fed. Rep. of Germany

Filed Apr. 9, 1981, Ser. No. 252,346

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1980, 3014574

Int. Cl.³ C10B *39/02, 39/12, 45/00*

U.S. Cl. 201—41 **4 Claims**



1. A method of discharging coke from a dry coke cooling chamber having an ante-chamber for receiving coke to be cooled, a cooling space downstream of the ante-chamber and an outlet for the coke downstream of the cooling space, comprising the steps of:

feeding coke from the cooling chamber outlet to an inlet of a breeches chute, continuously on an endless conveyor;

selectively discharging coke fed to the breeches chute to one of a plurality of outlets of the breeches chute;

providing a lock bin at each outlet of the breeches chute having a pair of gastight gates, an upper one of the gates provided with a slighter structure than the lower one so that the lower one only is adapted to support coke thereon;

opening an upper one of the gastight gates only when coke is discharged from the breeches chute into that one of the lock bins having the open upper gastight gate;

holding a lower gastight gate of the lock bin closed as coke fills into the lock bin through the open upper gastight gate; and

opening the lower gate when the upper gate is closed to

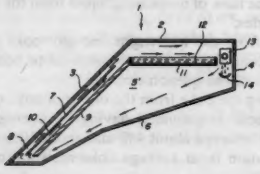
discharge coke from the lock bin which now has a closed upper gate.

4,344,824

RECIRCULATING NATURAL CONVECTION SOLAR STILL

Bertrand S. Soleau, Jr., 4203 Kincaid Ct., Chantilly, Va. 22021

Filed Jun. 27, 1980, Ser. No. 163,523
Int. Cl.³ B01D *3/00*; F24J *3/02*; C02B *1/04*
U.S. Cl. 202—234 **6 Claims**



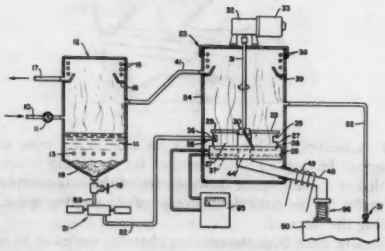
1. A solar still comprising means for defining a natural recirculating air convection loop including means for heating relatively dry air comprising a heat absorber means positioned between a first angularly disposed transparent plate and an air partition means; means for providing relatively moist air from said relatively dry air comprising a horizontally disposed transparent plate positioned over a first trough for containing saline water; and means for removing moisture from said relatively moist air to provide said relatively dry air, comprising a condenser means positioned over a second trough for collecting condensed moisture.

4,344,825

METHODS AND APPARATUS FOR SEPARATING CLEANING SOLVENTS FROM ROSIN FLUX AND OTHER CONTAMINANTS

Darrel R. Colwell, Oklahoma City, Okla., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Apr. 22, 1981, Ser. No. 256,427
Int. Cl.³ B01D *3/02*
U.S. Cl. 203—1 **18 Claims**



13. A system for removing contaminants from a cleaning fluid, which comprises:

a plate with an annular-shaped trough formed therein;

a first distillation tank for distilling the cleaning fluid and collecting liquid contaminants at the bottom of the tank;

a metering device having an entrance opening and exit opening for compressing and transferring discrete metered charges of contaminant from the entrance opening to the exit opening;

means for flowing the liquid contaminant from the bottom of the first distillation tank to said entrance opening;

means for flowing the metered charges of liquid contaminant from the exit opening to the trough in said plate;

means for cyclically operating the metering device to transfer discrete charges of contaminant to the exit opening to flow said charges through said flowing means to deposit each charge in said trough;

a second distillation tank enclosing said plate for distilling the charges flowed into said trough;

a plurality of blades, each blade having a shape conforming to the shape of said trough, each adjacent pair of blades cooperating with the trough to define a plurality of compartments of equal volume to receive only one of each successive charge;

said plate having a discharge opening formed therein to extend in and across said trough at a position adjacent to but spaced from said discharge opening;

means for rotating said blades to move along said annular trough to advance each compartment to move each deposited discrete charge along a portion of said trough into said discharge opening; and

means for delivering the distilled cleaning fluid from the second distillation tank back into the first distillation tank.

18. A method of separating perchloroethylene from a mixture of perchloroethylene, rosin and other contaminants, which comprises:

placing the mixture in a first still to heat and vaporize a substantial portion of the perchloroethylene while collecting a liquid residue of perchloroethylene, rosin and other contaminants in the bottom of the still;

removing the liquid residue from the bottom of the first still and forming discrete charges of predetermined volume;

cyclically transferring the discrete charges into a trough formed in a plate contained in a second still, each of said discrete charges being transferred into only one of a succession of compartments of equal volumes,

heating the plate to a sufficient temperature to vaporize another substantial portion of the perchloroethylene from the residue mixture without decomposing or charring the perchloroethylene, rosin and other contaminants;

condensing the perchloroethylene in the top portion of the second still;

returning the condensed perchloroethylene to the first still for further distillation;

moving the compartments with the discrete charges of residue mixture along the trough while the perchloroethylene is vaporized;

passing the non-vaporized residue mixture from the trough into a closed receiving receptacle;

heating the residue mixture as it passes from the trough into the receiving receptacle; and

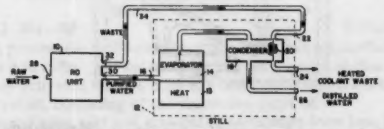
venting any perchloroethylene vapors in the receptacle back into the second still.

4,344,826

DISTILLATION SYSTEM AND PROCESS

Verity C. Smith, Dedham, Mass., assignor to Vaponics, Inc., Plymouth, Mass.

Filed Jun. 20, 1980, Ser. No. 161,338
Int. Cl.³ C02F *1/04, 1/44*
U.S. Cl. 203—2 **10 Claims**



1. A distillation system comprising:

an RO unit having a feed water inlet, a treated water outlet, and a waste water outlet;

a still having an evaporator and a condenser, said evaporator having a treated water inlet and a treated water outlet, and said condenser having a treated water inlet, a treated

water outlet and a cooling coil with a feed water inlet and a heated water outlet, and

conduit means for connecting said evaporator to said condenser, for connecting said RO unit waste water outlet to said cooling coil inlet and for connecting said RO unit treated water outlet to said evaporator inlet.

4,344,827

PROCESS FOR WORKING UP NITRIC ACID

Wolfgang Auge, Cologne; Bernd Thelen, Leverkusen, both of Fed. Rep. of Germany; Karl-Werner Thiem, Charleston, S.C., and Rütger Neeff, Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 50,906, Jun. 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 820,529, Jul. 29, 1977, abandoned. This application Jun. 30, 1980, Ser. No. 164,445

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1976, 2637734

Int. Cl.³ B01D *1/00, 3/14*

U.S. Cl. 203—13 **10 Claims**

1. Process for working up aqueous nitric acid which has a concentration of about 70 to about 80% by weight and contains anthraquinone and nitroanthraquinones in solution or suspension, said process comprising (1) feeding the nitric acid containing anthraquinone and nitroanthraquinones into the rectification section of a rectification column, (2) taking off nitric acid which has a concentration above the azeotropic concentration at the top of the column until, in the liquid phase, the azeotrope point for nitric acid has been reached and then (3) completely evaporating this acid in a separate apparatus to obtain the azeotropic nitric acid with the proviso that in step (2) the weight ratio, adjusted to provide a non-explosive mixture of nitric acid plus water to organic compounds is at least 13, 8, 5 and 4 when the nitric acid concentration in the liquid phase is 80, 75 and 70 and 68 by weight, respectively.

4,344,828

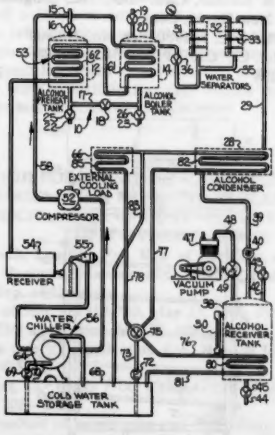
ENERGY EFFICIENT DISTILLATION APPARATUS

James D. Melton, P.O. Drawer 206, Shelby, N.C. 28150

Continuation-in-part of Ser. No. 115,904, Jan. 28, 1980, abandoned. This application Aug. 31, 1981, Ser. No. 297,852

Int. Cl.³ B01D *3/02*

U.S. Cl. 203—19 **7 Claims**



1. A method of distilling grain mash at a dairy farm or the like and characterized by the ability to efficiently utilize the required energy and the resulting products, and comprising the steps of

providing distilland evaporating receptacle means, distillate condensing receptacle means, and a conduit operatively interconnecting the evaporating receptacle means and condensing receptacle means,

providing a bulk milk container for containing milk,

operating a vapor compression refrigeration system which comprises condenser coil means for producing heat energy and evaporator coil means for producing a cooling potential, and including directing at least a substantial portion of the heat energy of said condenser coil means to said evaporating receptacle means to heat and vaporize the distilland therein, and selectively directing the cooling potential from said evaporator coil means to either one or both of said condensing receptacle means and said bulk milk container, and

recovering an alcoholic distillate from said condensing receptacle means.

4,344,829

PROCESS FOR RECOVERY OF BENZENE AND CHLORINE FROM WASTE PRODUCTS

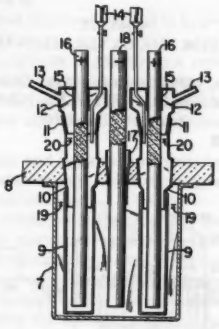
Heinz-Manfred Becher, Bingen, Fed. Rep. of Germany, assignor to Celamerck GmbH & Co. KG, Ingelheim, Fed. Rep. of Germany

Continuation of Ser. No. 164,589, Jun. 30, 1980, abandoned. This application Mar. 13, 1981, Ser. No. 243,386

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1979, 2926329

Int. Cl.³ C25B *1/26;* **C25C** *1/16, 3/04*

U.S. Cl. 204—72 **4 Claims**



1. In the method of recovering benzene and chlorine from a mixture of isomeric hexachlorocyclohexanes obtained as a waste product in the manufacture of lindane, which comprises reacting said mixture with zinc and subjecting the resulting zinc chloride to electrolysis, the improvement which resides in that the reaction is performed with a solution of said mixture of isomeric hexachlorocyclohexanes in a substantially water-immiscible organic solvent which is stable under the reaction conditions in the cathode compartment of a diaphragm electrolysis cell, and the zinc is produced at the cathode of said cell.

4,344,830

UV CURABLE RESINS AND SULFONATE ESTERS OF BENZOTRIAZOLES USED IN SUCH RESINS

Daniel R. Olson, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 660,260, Feb. 23, 1976, abandoned. This application May 20, 1980, Ser. No. 151,663

Int. Cl.³ C08K *5/27;* **C08F** *2/50*

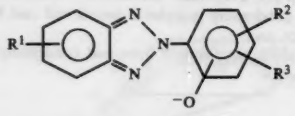
U.S. Cl. 204—159.16 **5 Claims**

1. A UV curable paintable composition consisting essentially of UV curable material selected from the class consisting of an acrylic monomer-polymer mixture, a polyester resin, an epoxy

resin, and a polythiol-polyene resin, from 1 to 10 parts of a photoinitiator selected from the class consisting of ketones, benzoin ethers, quinones, and a cationic initiator, per 100 parts of the UV curable organic material and 0.1 to 10% by weight of the UV curable composition of a sulfonate ester of the formula,

$$Z-[SO_2]-R,$$

where Z is



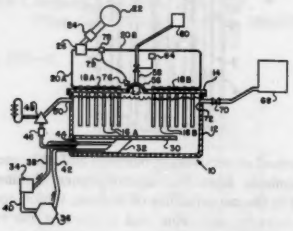
R is selected from $C_{(6-13)}$ aryl radicals and R^1, R^2, and R^3 are the same of different monovalent radicals selected from hydrogen, halogen, $C_{(1-20)}$ alkyl, $C_{(1-20)}$ alkoxy, and R radicals.

4,344,831

APPARATUS FOR THE GENERATION OF GASEOUS FUEL

Charles T. Weber, 11307 Green Bay Ave., Chicago, Ill. 60617

Filed Sep. 12, 1980, Ser. No. 186,607
Int. Cl.³ C25B *9/00*
U.S. Cl. 204—228 **5 Claims**



1. Apparatus for the electrolytic generation of a hydrogen-oxygen fuel mixture comprising:

an electrolytic tank containing an electrolyte solution and having a plurality of carbon electrodes suspended therein;

a horizontally extending baffle in said tank beneath said electrodes partially dividing said tank into an upper chamber and a lower chamber, said baffle being open at one end;

a recirculating electrolyte line communicating with the upper chamber of said tank and with the closed end of said lower chamber and having solution recirculating means therein;

means connected to said tank for cooling the electrolyte solution;

a dome in the top of said tank for accumulating gases formed in said tank by electrolysis;

a gas outlet in the top of said dome; and

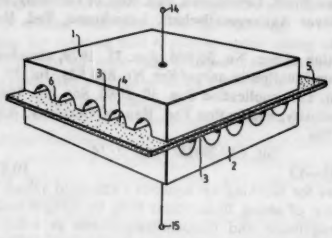
a source of electric power communicating with said electrodes.

4,344,832

ELECTRODE SYSTEM FOR A FUEL OR ELECTROLYSIS CELL ARRANGEMENT

Reinhard Dahlberg, Flein, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 1, 1980, Ser. No. 165,110
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1979, 2926776
Int. Cl.³ C25B *9/00, 11/02, 11/04;* H01M *2/00*
U.S. Cl. 204—258 **10 Claims**



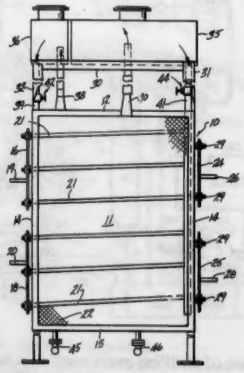
1. An electrode system for a fuel and/or electrolysis cell, in which: two plates or discs made from suitable material are provided as the anode and cathode electrodes; each plate or disc has a thickness of less than 5×10^{-2} cm and a structure of alternating and parallel ridges and grooves at least on one of its two surfaces; the two plates or discs with at least one membrane as an intermediate layer are assembled with their structured surfaces such that all of the ridges in the structure of both plates cross and at the crossing points abut against both sides of the membrane so that the grooves form two crossing systems of semicylinders running in parallel with each other, and separated by the membrane; and the current density through the electrodes is less than 2×10^{-2} amperes/cm^2.

4,344,833

RESTRICTOR APPARATUS FOR ELECTROLYTE FLOW CONDUIT

David B. Wright; Sanders H. Moore, both of Cleveland, Tenn., and Morton S. Kircher, Clearwater, Fla., assignors to Olin Corporation, New Haven, Conn.

Filed Dec. 8, 1980, Ser. No. 213,800
Int. Cl.³ C25B *9/00, 15/02, 15/08*
U.S. Cl. 204—258 **23 Claims**



1. In an electrolytic filter press cell having electrolyte circulated through anode and cathode frames, an anolyte disengager and a catholyte disengager to remove gases from the anolyte

and the catholyte fluids, at least a first flow conduit and a second flow conduit in fluid flow communication with each anode and the anolyte disengager, the improvement comprising in combination:

(a) a feed pipe extending from the anolyte disengager within the first flow conduit a predetermined distance to inject concentrated electrolyte into each anode; and

(b) variable flow restrictor means in the first flow conduit from the anolyte disengager to each anode frame cooperative with the feed pipe to selectively vary the flow rate of electrolyte through the anolyte disengager to thereby control the level of forming in the anolyte within the anolyte disengager to optimize the amount of gas separated out within the anolyte disengager.

4,344,834

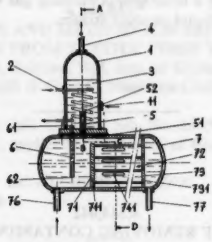
APPARATUS FOR COOLING AND PURIFICATION OF EXIT GASES FROM AN ELECTROLYSIS INSTALLATION

Gerard Pere, Le Breuil, France, assignor to Creusot-Loire, Paris, France

Filed May 1, 1980, Ser. No. 145,752

Int. Cl.³ C25B 9/00

U.S. Cl. 204—278 **2 Claims**



1. An apparatus for cooling and purifying gases exiting from a conduit of a degasser in an electrolysis installation, said apparatus comprising a chamber for demineralized water connected to said conduit and located above said degasser, at least one exterior inlet for said water, a coil within said chamber, a source of cold water connected to said coil for cooling the water in said chamber, an outlet on said chamber for exit of cooled purified gases and a pipe connecting said chamber to said degasser for return of water to said degasser wherein said exterior inlets constitute the only supply for demineralized water for said electrolysis installation.

4,344,835

METHOD FOR MONITORING AND CONTROLLING HYDROGENATION PRESSURE IN PLANT FOR THE HYDROGENATION OF COAL WITH HYDROGEN TO FORM HYDROCARBONS

Klaus Koch, Laatzen, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hannover Kleefeld, Fed. Rep. of Germany

Division of Ser. No. 151,763, May 21, 1980, Pat. No. 4,288,405. This application Jan. 14, 1981, Ser. No. 225,011

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1979, 2948550

Int. Cl.³ C10G 1/00; C10B 47/00, 47/20, 57/12

U.S. Cl. 208—8 R **4 Claims**

1. A method of monitoring and controlling the hydrogenation pressure in apparatus for the hydrogenation of coal with hydrogen to form hydrocarbons, in which apparatus the coal is fed into a preparation chamber, is compressed and conveyed by means of a rotatable element connected to a drive means through the preparation chamber and plasticized by frictional heating, the plasticized coal is fed through a feed aperture communicating the preparation chamber with the hydrogenation chamber, and said plasticized coal is impinged on with hydrogen and hydrogenated at a pressure of up to 500 bars and a temperature of up to 500° C., after which it is passed to a separator, said method comprising the steps of:

(a) monitoring the pressure in said hydrogenation chamber;

(b) monitoring the pressure in said preparation chamber at the end adjacent said hydrogenation chamber,

(c) comparing said pressures,

(d) closing said feed aperture responsive to said comparison, and

(e) stopping said conveying of said compressed coal in said preparation chamber when said measured pressure in said preparation chamber drops below said measured pressure in said hydrogenation chamber.

4,344,836

METHOD FOR CONVERTING COAL TO HYDROCARBONS BY HYDROGENATION

Klaus Koch, Laatzen, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover Kleefeld, Fed. Rep. of Germany

Division of Ser. No. 151,827, May 21, 1980. This application Jan. 14, 1981, Ser. No. 225,013

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1979, 2943537

Int. Cl.³ C10G 1/00

U.S. Cl. 208—8 R **10 Claims**

1. The method of converting coal to hydrocarbons, comprising the steps of:

(a) feeding particles of coal from a pressure-sealed vessel into a feed and preparation chamber,

(b) compressing and shearing said particles in said feed and preparation chamber, thereby agglomerating said particles,

(c) conveying said agglomerated particles to a hydrogenation chamber openly communicating with said feed and preparation chamber,

(d) hydrogenating said agglomerated particles of coal by intensively mixing and shearing said particles in the presence of hydrogen under high pressure, the hydrogen effecting an even distribution and dispersement of the particles throughout the hydrogenation chamber, and

(e) discharging the hydrogenated coal particles through a pressure-sealed outlet.

4,344,837

PROCESS FOR THE DEHYDRATION AND LIQUEFACTION OF WATER-CONTAINING COAL

Tadashi Komiyama, Yokohama; Shoichi Oi; Noriaki Ohnishi, both of Ohmuta; Shinya Mori, Kurume; Tadanobu Takata, Aaro, and Isao Kubo, Tokyo, all of Japan, assignors to Mitsui Coke Co., Ltd., Japan

Filed Mar. 30, 1981, Ser. No. 248,693

Claims priority, application Japan, Apr. 15, 1980, 55-48717; Apr. 18, 1980, 55-50330

Int. Cl.³ C10G 1/00

U.S. Cl. 208—8 LE **10 Claims**

1. In a process for the dehydration of water-containing coal wherein a slurry of the water-containing coal and a solvent is heated to a temperature in the range of from 100° to 350° C. and the heated slurry is subjected to vapor-liquid separation by which a gas mixture including water vapor is separated from the dehydrated slurry, the improvement which comprises mixing a part of the dehydrated slurry with an undehydrated slurry of the water-containing coal and the solvent and dehydrating the resulting mixed slurry by heating it to said temperature.

4,344,838

COAL CONVERSION CATALYSTS

Thomas O. Mitchell, Trenton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 86,212, Oct. 18, 1979, Pat. No. 4,295,954.
This application Apr. 20, 1981, Ser. No. 255,912
Int. Cl.³ C10G *1/06*
U.S. Cl. 208—10 4 Claims

1. In a solvent extraction process for coal conversion wherein coal is slurried in an organic solvent and heated to a temperature sufficient to dissolve or liquefy most of the coal, the resulting coal liquefaction product is upgraded by catalytic hydrogenation, and a process-derived recycle solvent is hydrogenated and returned to the initial dissolution stage; the improvement which comprises contacting materials selected from the group consisting of said coal liquefaction product, and said process-derived recycle solvent with a catalyst selected from the group consisting of:

(1) spent hydrogenation catalyst from processes for the hydrogenation of hydrocarbons selected from the group consisting of petroleum, petroleum-derived liquids, Fischer-Tropsch liquids, and shale oils;

(2) spent adsorbent from guard chambers used to demetallize said hydrocarbons; and

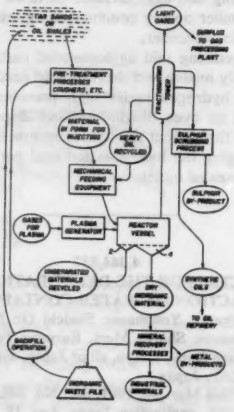
(3) mixtures thereof.

4,344,839

PROCESS FOR SEPARATING OIL FROM A NATURALLY OCCURRING MIXTURE

Michael M. Pachkowski, 23141 - 72nd Ave., Langley, British Columbia, and Howard V. Ross, 620 Montreal Trust Bldg., 789 W. Pender St., Vancouver, British Columbia, both of Canada

Filed Jul. 7, 1980, Ser. No. 166,052
Int. Cl.³ C10G *1/00;* H05H *1/42*
U.S. Cl. 208—11 R 14 Claims



1. A process for separating hydrocarbons from naturally occurring mixtures comprising minerals and inorganic materials originating from rock admixed with oil, the process comprising introducing particles of such mixtures into a gaseous plasma of a chemically inert gas in a sealed reactor vessel in which the plasma electron temperature is in the range 10,000° F. to 80,000° F. to vaporize the hydrocarbons and thus separate them from the solid particles, allowing the solid particles to drop from the plasma and condensing the vaporized oil as a separate stock, the sealed reactor vessel being equipped with pressure control whereby the plasma is shut off and the vessel purged with an inert gas immediately the pressure drops below two pounds per square inch.

4,344,840

HYDROCRACKING AND HYDROTREATING SHALE OIL IN MULTIPLE CATALYTIC REACTORS

John G. Kunesh, Lawrenceville, N.J., assignor to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Filed Feb. 9, 1981, Ser. No. 232,787
Int. Cl.³ C10G *47/24*
U.S. Cl. 208—59 8 Claims

1. A process of hydrocracking and hydrotreating heavy hydrocarbon feedstock containing a contaminant compound which precipitates at temperatures below the reaction temperature, which comprises:

(a) preheating the feedstock to temperature below which contaminant precipitation occurs and introducing the heated feed with hydrogen into a first reaction zone containing an ebullated catalyst bed;

(b) reacting the feedstock in the ebullated bed first reaction zone at 700°–860° F. temperature and 1500–3000 psig hydrogen partial pressure conditions, and precipitating the precipitable material in the catalyst in the bed;

(c) passing the reaction zone effluent on to a second reaction zone containing a fixed catalytic bed maintained at 750°–850° F. temperature for further hydrotreating the feed; and

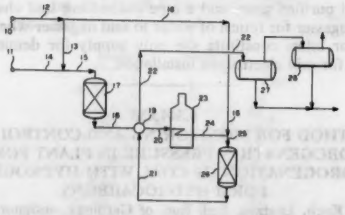
(d) recovering a hydrogen-containing gas stream and a hydrotreated liquid product stream.

4,344,841

METHOD OF REMOVING CONTAMINANT FROM FEEDSTOCK STREAMS

Marvin M. Johnson, and Gerhard P. Nowack, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 1, 1979, Ser. No. 80,604
Int. Cl.³ B01D *15/00*
U.S. Cl. 208—211 29 Claims



16. A method of hydrodesulfurizing a petroleum feedstock stream comprising:

contacting a petroleum feedstock stream contaminated with at least one of the group consisting of chromates, silicates, phosphates, aldehydes, ketones, thiols, sulfides, carboxylates, sulfonates, sulfates, polyoxyethylenes, carboxylic esters, dimethylsilicone, phenylpolysiloxane, glycols, phthalates, polysaccharides, and cellulosic ethers, with an adsorbent comprising amorphous silica to produce a purified petroleum feedstock stream; and

subsequently contacting the purified petroleum feedstock stream with a hydrosulfurization catalyst under conditions effective for hydrodesulfurization to produce a hydrodesulfurized feedstock stream.

4,344,842

REACTIVE IRON OXIDE AGENTS FOR SCAVENGING HYDROGEN SULFIDE FROM HYDROCARBON LIQUIDS

Irwin Fox, 37 Meadowbrook Country Club Estates, Ballwin, Mo. 63011, assignor to Irwin Fox, Ballwin, Mo.; Alvin Samuels, New Orleans, La. and David Samuels, St. Louis, Mo.

Continuation-in-part of Ser. No. 44,026, May 31, 1979, Pat. No. 4,246,244, which is a continuation-in-part of Ser. No. 963,797, Nov. 27, 1978, Pat. No. 4,246,243. This application Dec. 31, 1980, Ser. No. 221,897

The portion of the term of this patent subsequent to Jan. 20, 1998, has been disclaimed.

Int. Cl.³ C10G *29/16*

U.S. Cl. 208—244 4 Claims

1. The process for scavenging hydrogen sulfide from a hydrocarbon liquid containing said sulfide which comprises contacting the hydrogen sulfide in said liquid with dry or substantially dry iron oxide particles having a surface area of at least 3.5 $m^2/_g$ and composed of a crystalline phase of Fe_2O_3, Fe_3O_4 and combinations together with an amorphous Fe_2O_3 moiety, said particles being used in an amount sufficient to reduce the hydrogen sulfide concentration in said liquid to a predetermined level.

4,344,843

APPARATUS AND METHOD FOR SEPARATING DEBRIS FROM TEXTILE FIBER TUFTS

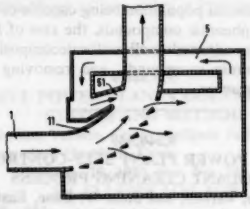
Ferdinand Leifeld, Kempen, Fed. Rep. of Germany, assignor to Trutzschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Filed Feb. 19, 1981, Ser. No. 235,997

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1980, 3006831

Int. Cl.³ B07B *7/02, 7/06*

U.S. Cl. 209—143 13 Claims



1. Apparatus for separating debris from pneumatically conveyed textile fiber tufts moving through a conduit and comprising

housing means cooperating with said conduit for defining a debris separation chamber,

means cooperating with said conduit for defining a curving deflection area for a stream of air flowing through said conduit and cooperating with said housing means for diverting into said separation chamber from the greater radius of said deflection area a debris laden portion of the stream of air for separating debris from the portion of the stream of air and for thus removing from said conduit debris being pneumatically conveyed with the fiber tufts, and

means cooperating with said conduit for returning the diverted portion of the stream of air from said separation chamber into said conduit after separation of debris therefrom and at a location downstream and adjacent the lesser radius of said deflection area so as to restore the stream of air flowing through said conduit to substantially the original volume.

4,344,844

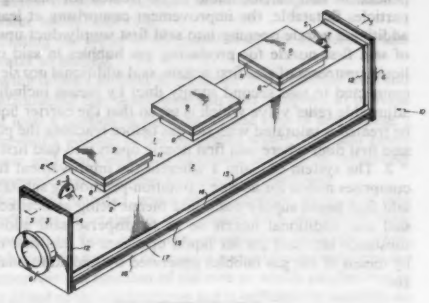
INCLINED STATIC DEOILER AND CONDITIONER FOR TREATING ORE

J. O. Townley, P.O. Box 221, Candler, Fla. 32624

Filed Mar. 17, 1981, Ser. No. 244,601

Int. Cl.³ B03D *1/00*

U.S. Cl. 209—168 9 Claims



1. An inclined static deoiler and conditioner for treating ore in liquid prior to and after froth flotation comprising in combination:

a trough means,

first baffle means oriented to cause turbulence on the liquid-/ore in said trough said first baffle means formed from two ply material provided with an interior air space between said plies,

end walls on said trough having an inlet and an outlet adapted to fasten to piping,

and means to angulate said trough to alter the liquid flow rate.

4,344,845

METHOD AND A DEVICE FOR MAKING FLOTABLE PARTICLES SUSPENDED IN A LIQUID BY MEANS OF GAS BUBBLES

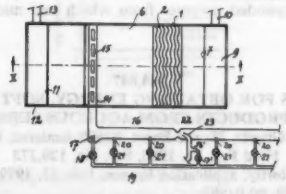
Jacob Pielkenrood, Krommenie, Netherlands, assignor to Pielkenrood-Vinitex B.V., Netherlands

Continuation of Ser. No. 52,748, Jun. 28, 1979, abandoned. This application Dec. 22, 1980, Ser. No. 218,645

Claims priority, application Netherlands, Jun. 30, 1980, 7807081

Int. Cl.³ B03D *1/24;* B01F *3/04*

U.S. Cl. 210—199 3 Claims



1. In a system for separating by flotation components suspended in a carrier liquid supplied from a source of carrier liquid, the system including a chamber defining a flotation space, a first supply duct for the carrier liquid to be treated opening in an outlet at said space near the bottom thereof, a second liquid source independent of the source of carrier liquid, a second supply duct independent of the first supply duct connected to means for mixing a gas under elevated pressure with a second liquid from the second liquid source in said second supply duct so as to saturate said second liquid with said gas at said elevated pressure, a relief valve in said second

duct adapted for suddenly reducing the pressure of said second liquid so as to supersaturate said second liquid with said gas, said second duct beyond said relief valve terminating in a first nozzle opening near the outlet of said first liquid supply duct so as to create a flow of small gas bubbles in the flow of said carrier liquid to be treated prior to entering said flotation space, at least a part of said bubbles adhering to particles suspended in said carrier liquid to be treated for making these particles flotatable; the improvement comprising at least one additional nozzle opening into said first supply duct upstream of said first nozzle for producing gas bubbles in said carrier liquid upstream of said first nozzle, said additional nozzle being connected to said second supply duct by means including an adjustable relief valve which is set so that the carrier liquid to be treated is saturated with the gas before reaching the point in said first duct where said first nozzle opens into said first duct.

2. The system of claim 1 wherein the improvement further comprises means for adding a flotation-promoting substance to said first liquid supply duct, said means being associated with said one additional nozzle so as to disperse said additional substance into said carrier liquid upstream of said first nozzle by means of the gas bubbles generated by said additional nozzle.

4,344,846

FILTRATION USING EXPANDED STYRENE-POLYMER AND POLYOLEFIN MICRO-BITS

Max Klein, 257 Riveredge Rd., Tinton Falls, N.J. 07724, assignor to Max Klein, Shrewsbury, N.J.

Continuation-in-part of Ser. No. 833,644, Sep. 15, 1977, Pat. No. 4,207,378, which is a continuation-in-part of Ser. No. 342,535, Mar. 16, 1973, abandoned. This application May 19, 1980, Ser. No. 150,736

Int. Cl.³ B01D *39/04, 39/06*

U.S. Cl. 210—503 **6 Claims**

1. A filter aid composition consisting essentially of from about 90 to about 99 parts of an inorganic filter aid material having admixed therewith from about 1 to about 10 parts of polymer micro-bits produced from the group of an expanded styrene-polymer, or an expanded polyolefin, which is the polymer of an ethylenically unsaturated hydrocarbon monomer having from 2 to 6 carbon atoms, each said polymer being non-brittle in the form used to produce said micro-bits, said micro-bits being from about 325 to about 40 microns long and from about 325 to about 20 microns wide in particle size, from substantially completely to entirely completely free of intact cells of the expanded polymer from which said micro-bits are produced, substantially without any uniformity in outline of the individual micro-bit particles, and having a density from about 85 percent of, to substantially the same as, the specific unexpanded polymer from which there was provided the aforesaid expanded polymer from which said micro-bits are produced.

4,344,847

PROCESS FOR OBTAINING ENERGY, SOFT WATER AND BY-PRODUCTS FROM AQUEOUS SUBSTANCES

Edouard P. Grenet, 28, rue Bapst, 92600 Asnieres, France

Filed Feb. 11, 1980, Ser. No. 120,273

Claims priority, application France, Feb. 13, 1979, 79 03584; Jan. 29, 1980, 80 01882

Int. Cl.³ B01D *1/00*

U.S. Cl. 210—600 **10 Claims**

1. A process for the purification of water which comprises the steps of (a) introducing the water source to be purified into a pressure vessel, provided with vapor duct means and residue recovery means; (b) heating said vessel to vaporize the water content from said source while pressurizing same; (c) feeding, via said duct means, at least a fraction of said pressurized water vapor into contact with a bed of iron at about 800° C. to reduce some of the contact water vapor to hydrogen; (d) separating and collecting the generated hydrogen; (e) removing the residue from said pressure vessel via said recovery means; (f) expanding the unreacted water vapor through a turbine-generator to generate electrical energy; (g) utilizing and recovering said generated energy; and (h) condensing the water vapor to pure liquid water.

4,344,848

PROCEDURE FOR PURIFYING WASTE WATER IN A FLOATING LAYER REACTOR

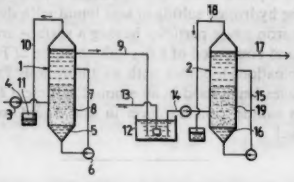
Risto R. Hakulinen, Imatra, Finland, assignor to Enso- Gutzeit Osakeyhtiö , Helsinki, Finland

Filed Dec. 11, 1980, Ser. No. 215,407

Claims priority, application Finland, Dec. 13, 1979, 793914

Int. Cl.³ C02F *3/08*

U.S. Cl. 210—617 **11 Claims**



1. A process for purifying waste water containing chlorinated phenolic compounds comprising passing the waste water upwardly under anaerobic conditions through a bed of particles selected from the group consisting of anionic resin, clay, mud and activated carbon in a reactor so as to fluidize the bed of particles, said particle bed having affixed thereto a bacterial population comprising at least one strain of bacteria growing in trichlorophenol and at least one strain of bacteria growing in tetrachlorophenol and which belong to the bacterial strains deposited at the institute of microbiology of the University of Helsinki with the deposition codes YM 241-268 or YM 134-202, said bacterial population being capable of decomposing chlorinated phenolic compounds, the rate of flow of the waste water being adjusted to allow for decomposition of said chlorinated phenolic compounds, and removing the waste water from the reactor.

4,344,849

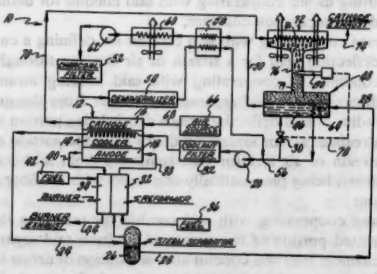
FUEL CELL POWER PLANT SELF-CONTROLLING COOLANT CLEANING PROCESS

Albert P. Grasso, Vernon, and John W. Lane, East Hampton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 19, 1981, Ser. No. 226,267

Int. Cl.³ C02F *1/20, 1/28*

U.S. Cl. 210—662 **4 Claims**



1. In a fuel cell power plant including a stack of fuel cells and coolant water circulating within a coolant loop in heat exchange relationship with the stack to cool the stack, a portion

of said water being removed from the coolant loop for use elsewhere in the power plant, the process for automatically maintaining the circulating coolant water clean and for providing clean make-up water to said coolant loop comprising the steps of:

supplying coolant loop make-up water to a water reservoir by condensing water from at least one of the reactant gas exhaust streams of the stack and conveying the condensed water to the reservoir via a vertically extending deaeration column having an opening at its upper end for receiving the condensate from the reactant gas stream and an opening at its lower end above the water in the water reservoir;

deaerating the water in the water reservoir by heating said water to boiling to produce steam which rises into said deaeration column;

blowing down a portion of the water in the coolant loop and introducing the blowdown into the reservoir to provide at least a portion of the heat for the step of deaerating, wherein said power plant includes a blowdown valve which permits said step of blowing down when open and prevents blowing down when closed;

controlling said blowdown valve by sensing the location of a steam/liquid interface within said deaeration column, comprising closing the valve when the steam/liquid interface is above a certain level and opening the valve when the steam/liquid interface is below a certain level;

removing deaerated water from the reservoir and purifying the removed water by removing suspended and dissolved solids therefrom; and

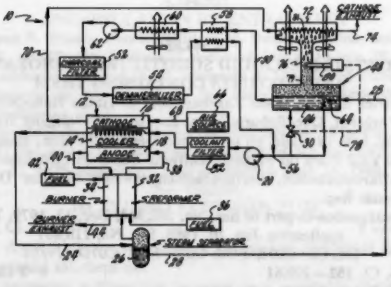
adding said purified water to the coolant loop at a rate sufficient to maintain the desired rate of coolant flow passing in heat exchange relationship with the stack, wherein the amount of blowdown introduced into the reservoir is a function of the rate at which purified water is added to the coolant loop and is sufficient to maintain an acceptable level of impurities in the circulating coolant water.

4,344,850

FUEL CELL POWER PLANT COOLANT CLEANING SYSTEM AND METHOD

Albert P. Grasso, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jan. 19, 1981, Ser. No. 226,266
Int. Cl.³ C02F *1/20, 1/28*
U.S. Cl. 210—664 **4 Claims**



3. In a fuel cell power plant including a stack of fuel cells and coolant water circulating within a coolant loop in heat exchange relationship with the stack to cool the stack and to convert at least a portion of the circulating coolant water to steam, a portion of said water being removed from the coolant loop for use elsewhere in the power plant, the process for maintaining the circulating coolant water clean and for providing clean make-up water to said coolant loop comprising the steps of:

using at least a portion of the steam to process fuel for use in the cells of the stack;

supplying coolant loop make-up water to a water reservoir by condensing water from at least one of the reactant gas exhaust streams of the stack and conveying the condensed water to the reservoir;

deaerating the water in the water reservoir by heating said water to boiling;

blowing down a portion of the water in the coolant loop and introducing the blowdown into said reservoir to provide at least a portion of the heat for the step of deaerating;

removing a portion of the deaerated water from said reservoir and purifying said removed portion by removing suspended and dissolved solids therefrom; and

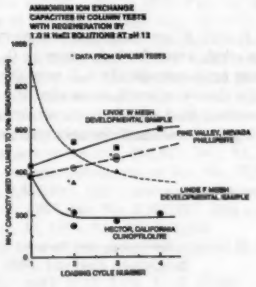
adding said purified water to the coolant loop at a rate sufficient to maintain the desired rate of coolant flow passing in heat exchange relationship with the stack, wherein the amount of coolant water blown down into the reservoir is a function of the rate at which purified water is added to the coolant loop and is sufficient to maintain an acceptable level of impurities in the circulating coolant water.

4,344,851

PHILLIPSITE-TYPE ZEOLITES FOR AMMONIA ADSORPTION

John D. Sherman, Chappaqua, and Ronald J. Ross, Upper Nyack, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 828,378, Aug. 29, 1977, abandoned, which is a continuation-in-part of Ser. No. 488,503, Jul. 15, 1974, abandoned. This application Jan. 16, 1981, Ser. No. 225,528
Int. Cl.³ C02F *1/42*
U.S. Cl. 210—670 **2 Claims**


AMMONIUM ION EXCHANGE CAPACITIES IN COLUMN TESTS WITH REGENERATION BY 1.0 N NaCl SOLUTIONS AT pH 12
* DATA FROM EARLIER TESTS
LINDE W MESH DEVELOPMENTAL SAMPLE
PINE VALLEY, NEVADA PHILLIPSITE
LINDE F MESH DEVELOPMENTAL SAMPLE
HECTOR, CALIFORNIA CLINOPTILOLITE
LOADING CYCLE NUMBER

1. In the process for removing ammonium ions from an aqueous medium containing calcium ions which includes the steps of:

(a) contacting said aqueous solution with the sodium cation form of a crystalline zeolite whereby ammonium cations and calcium cations are exchanged with sodium cations of the crystalline zeolite, and isolating at least a portion of the ammonium and calcium cation depleted aqueous medium;

(b) regenerating the crystalline zeolite containing the ammonium and calcium cations resulting from step (a) by contacting same with an aqueous solution of sodium cation whereby at least a portion of the zeolitic ammonium and calcium cations are replaced by sodium cations;

(c) repeating the cycle which comprises step (a) followed by step (b) for at least three times so that the crystalline zeolite has undergone a total of at least four cycles;

the improvement which comprises employing as the crystalline zeolite, zeolite W or phillipsite.

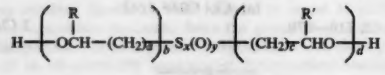
4,344,852
Patent Not Issued For This Number

4,344,853
FUNCTIONAL FLUID CONTAINING METAL SALTS OF ESTERS OF HYDROCARBYL SUCCINIC ACID OR ANHYDRIDE WITH THIO-BIS-ALKANOLS AS ANTIOXIDANTS

Antonio Gutierrez, Mercerville; Stanley J. Brois, Westfield; Jack Ryer, East Brunswick, and Harold E. Deen, Cranford, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 194,067, Oct. 6, 1980. This application Jun. 3, 1981, Ser. No. 270,137
Int. Cl.³ C10M *1/54;* C09K *5/00*
U.S. Cl. 252—33.6 **10 Claims**

1. A functional fluid composition having oxidative stability comprising a hydrocarbon mineral oil of lubricating viscosity containing as an oxidation inhibitor, about 0.01 to 1 wt. % of a zinc or nickel salt of ester compound formed by the reaction of: (a) a thio-bis-alkanol of the formula:



wherein R and R' each independently may be hydrogen, methyl or ethyl, x may be 1–4, y may be 0, 1 or 2 and a, b, c, d each may be independently 1–3, with (b) 1 to 2 moles, per mole of the thio-bis-alkanol, of an aliphatic hydrocarbon substituted succinic acid or anhydride wherein the aliphatic hydrocarbon group contains from about 12 to 50 carbon atoms.

4,344,854
SULFURIZED COMPOSITIONS

Kirk E. Davis, Euclid, and Thomas F. Holden, Mentor, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 949,285, Oct. 6, 1978, abandoned, which is a continuation-in-part of Ser. No. 814,583, Jul. 11, 1977, Pat. No. 4,119,550, which is a continuation-in-part of Ser. No. 666,545, Mar. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 560,676, Mar. 21, 1975, abandoned. This application Jul. 16, 1979, Ser. No. 58,233
The portion of the term of this patent subsequent to Oct. 10, 1995, has been disclaimed.
Int. Cl.³ C10M *1/38, 3/32;* C07G *17/00;* C09B *49/00*
U.S. Cl. 252—45 **39 Claims**

1. A method for the preparation of a sulfurized composition which comprises the steps of reacting at about 50°–300° C., under superatmospheric pressure and in the absence of catalysts, sulfur and hydrogen sulfide with at least one olefinic compound containing 3 to about 30 carbon atoms to form a sulfurized mixture; about 1.2–3.0 gram-atoms of sulfur and about 0.1–1.5 moles of hydrogen sulfide being used per mole of olefinic compound; and removing from said sulfurized mixture substantially all low boiling materials including unreacted olefin, mercaptan and monosulfide.

4,344,855
PROCESS FOR THE PRODUCTION OF POLYISOCYANATES WHICH CONTAIN CARBODIIMIDE GROUPS AND WHICH ARE STABLE IN STORAGE

Walter Schäfer, Cologne; Kuno Wagner, Leverkusen, and Hans-Dieter Block, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 12, 1976, Ser. No. 741,432
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1975, 2552350
Int. Cl.³ C09K *3/00*
U.S. Cl. 252—182 **10 Claims**

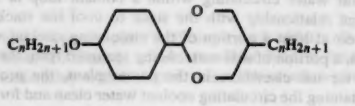
1. A process for preparing a storage stable, catalyst-free, equilibrium mixture of an organic carbodiimide, an organic uretoneimine and an organic isocyanate comprising the steps:
(a) contacting an organic mono- and/or polyisocyanate with a high molecular weight carbodiimidization catalyst which is insoluble in organic isocyanate and which comprises a high molecular weight, insoluble organic matrix and a low molecular weight carbodiimidization catalyst bound to the matrix via covalent bonds, and
(b) removing said high molecular weight catalyst when the desired degree of carbodiimidization has been reached.

4,344,856
CRYSTALLINE-LIQUID SUBSTITUTED 1,3-DIOXANES AND MIXTURES CONTAINING THEM

Dietrich Demus; Horst Zaschke, both of Halle; Hans-Mathias Vorbrodt, Quedlinburg; Horst Kresse, and Wolfgang Weissflog, both of Halle, all of German Democratic Rep., assignors to VEB Werk für Fernsehelektronik Berlin im VEB Kombinat Mikroelektronik, Berlin-Oberschoneweide, German Democratic Rep.

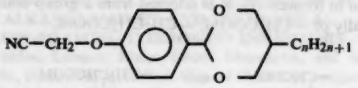
Continuation-in-part of Ser. No. 102,944, Dec. 12, 1979. This application Jan. 10, 1980, Ser. No. 110,857
Int. Cl.³ C09K *3/34;* G02F *1/13;* C07D *319/04*
U.S. Cl. 252—299.61 **3 Claims**

1. A compound of the formula:



wherein n=1 to 10.

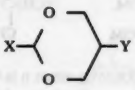
2. A compound of the formula:

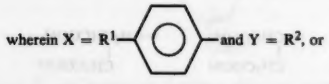


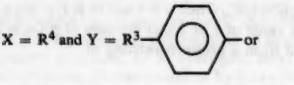
wherein n=1 to 10.

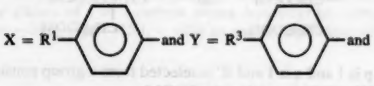
3. A liquid crystalline composition comprising a mixture of at least one compound selected from the group consisting of liquid crystalline substances, non-liquid crystalline substances, and mixtures thereof, and

a compound of the general formula:



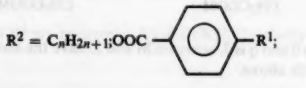






wherein $R^1 = C_nH_{2n+1}$; $C_nH_{2n+1}O$; $C_nH_{2n+1}COO$;

$C_nH_{2n+1}OCOO$; F; Cl; Br; OH;



$R^3 = C_nH_{2n+1}$; $C_nH_{2n+1}O$; CF^3; CN; NO_2;
$R^4 = C_nH_{2n+1}$, and n=1 to 10.

4,344,857

ENCAPSULATION BY ENTRAPMENT

Baruch S. Shasha, Peoria; William M. Doane, Morton, both of Ill., and Charles R. Russell, deceased, late of Peoria, Ill. (by Kathleen G. Russell, heir), assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 733,968, Oct. 19, 1976, Pat. No. 4,277,364, which is a continuation-in-part of Ser. No. 642,836, Dec. 22, 1975, abandoned. This application May 16, 1980, Ser. No. 150,550

Int. Cl.³ B01J *13/02;* **A01N** *25/26*

U.S. Cl. 252—316 **9 Claims**

1. A method of encapsulating a chemical biological agent comprising the steps of:

a. preparing a dispersion or solution of a suitable chemical biological agent in a matrix-forming material comprising an aqueous solution of a polyhydroxy polymer xanthate (PPX) having a xanthate degree of substitution (D.S.) of from about 0.1 to 3, wherein said solution has a concentration of PPX of from about 5–70%, and wherein the relative amount of said PPX with respect to said biological agent is sufficient to entrap said agent within a matrix of said PPX;

b. simultaneously adding to said dispersion a strong acid and a coupling agent selected from the group consisting of hydrogen peroxide, ferric sulfate, and ferric chloride, whereby the dispersion is adjusted to a pH of from about 2 to about 7 and whereby said PPX and said coupling agent react from a single phase to form an insolubilized matrix, thereby entrapping said agent; and

c. recovering said entrapped chemical biological agent.

4,344,858

ANTI-FOAMING COMPOSITIONS

Newton Zucker, Pepper Pike, and William M. Ellslager, South Euclid, both of Ohio, assignors to Kalcor Coatings Company, Inc., Willoughby, Ohio

Filed Mar. 23, 1977, Ser. No. 780,667

Int. Cl.³ B01D *19/04*

U.S. Cl. 252—358 **4 Claims**

1. An aqueous flowable composition for controlling foam in aqueous film-forming compositions consisting essentially of a nonaqueous phase consisting essentially of 5 to 25% by weight of the nonaqueous phase of a finely divided hydrophobic silica, and a hydrophobic liquid carrier therefor having dispersed therein a surfactant to permit the nonaqueous phase to be emulsified in an aqueous phase, said nonaqueous phase being emulsified in an aqueous phase consisting essentially of water with hydrophilic bentonite dispersed therein, in an amount at least about 10% of the weight of the silica, to a maximum amount such that the total composition is still flowable, the composition being characterized by being resistant to settling, and by an anti-foaming effect substantially greater than that of a similar composition without the bentonite.

4,344,859

HOMOGENIZING SYSTEM FOR PRODUCING HIGH POLYMER LATICES

Oliver W. Burke, Jr., Fort Lauderdale, Fla., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 539,607, Jan. 8, 1975, Pat. No. 4,243,566, which is a division of Ser. No. 323,381, Jan. 15, 1973, Pat. No. 3,862,078, said Ser. No. 323,381, is a continuation-in-part of Ser. No. 226,419, Feb. 15, 1972, Pat. No. 3,879,327, which is a continuation-in-part of Ser. No. 817,494, Apr. 18, 1969, abandoned, which is a continuation-in-part of Ser. No. 784,596, Dec. 18, 1968, Pat. No. 3,644,263, and a continuation-in-part of Ser. No. 767,790, Oct. 15, 1969, Pat. No. 3,622,127, and a continuation-in-part of Ser. No. 691,823, Dec. 10, 1969, abandoned, and a continuation-in-part of Ser. No. 70,949, Sep. 10, 1970, Pat. No. 3,652,482, and a continuation-in-part of Ser. No. 621,994, Mar. 9, 1967, Pat. No. 3,503,917. This application Dec. 19, 1979, Ser. No. 105,151

The portion of the term of this patent subsequent to Aug. 17, 1996, has been disclaimed.

Int. Cl.³ B01F *3/12, 5/08, 5/10, 11/02*

U.S. Cl. 252—359 D **8 Claims**

1. An improved apparatus for continuously converting a coarse aqueous emulsion of a solvent/polymer cement to a fine emulsion in which substantially all of the cement particles constituting the discontinuous phase are of precursor latex particle size, said apparatus being of the type comprising:

(a) a number of homogenizing units in which

(b) each of said units comprises an inlet and an outlet chamber with a restricted orifice therebetween and pressure raising means between its inlet and its restricted orifice,

wherein the improvement comprises:

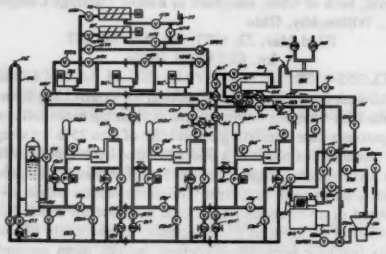
(c) a source of supply of said coarse emulsion,

(d) flow means connecting in series a sufficient number of said units to effect said conversion, with the inlet of the most upstream of said units connected to receive a flow of said coarse emulsion from said source of supply, the outlet chamber of each unit except the last connected to the inlet

of the unit next downstream therefrom, and the outlet chamber of the last, most downstream, unit, connected to a discharge line,

(e) said connecting means between said units each comprising a throttle valve and having connected thereto between said throttle valve and the inlet of the next downstream unit an "in"-check valve opening thereinto and a pressure relief limiting valve opening therefrom,

(f) said "in"-check valves being connected to be supplied with fine emulsion delivered from the outlet chamber of a unit downstream thereof at a pressure to essentially maintain against pressure drop and provide a predetermined feed pressure to said next downstream unit, and



(g) said pressure limiting valves being set to essentially maintain against pressure rise and provide the predetermined feed pressure to said most downstream unit, whereby the throttle valves control the back pressures in said outlet chambers while said in-check and pressure limiting valves control within fixed limits the pressures of the flows to the next succeeding units by adding to the flows between adjacent units, when necessary, minor proportions of fine emulsion from the flow being discharged from a unit downstream thereof and by removing from the flows between adjacent units, when necessary, minor proportions of the emulsion thereat.

4,344,860

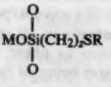
STABILIZATION OF SILICATES USING SALTS OF SUBSTITUTED NITROGEN OR SULFUR CONTAINING SILICONATES

Edwin P. Plueddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Mar. 30, 1981, Ser. No. 248,131
Int. Cl.³ C07F 7/02, 7/08, 7/10; C09K 3/00
U.S. Cl. 252—389 R **112 Claims**

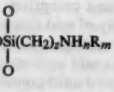
86. A method of inhibiting metal corrosion in an aqueous medium by adding to the aqueous medium a composition consisting of a siliconate selected from a group consisting of

(I) a siliconate having the general formula



and

(II) a siliconate having the general formula

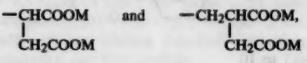


wherein in both formulas, M is selected from a group consisting essentially of

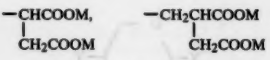
(i) alkali metal cations and

(ii) tetraorganoammonium cations and z has a value of 2 or 3,

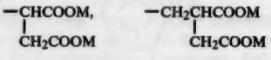
wherein in formula (I), R is selected from a group consisting essentially of —CH_2COOM, —CH_2CH_2COOM,



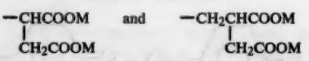
and wherein in formula (II), n has a value of 0 or 1; m has a value of 1 or 2, the sum of n+m is 2 and R is selected from a group consisting essentially of —CH_2COOM, —CH_2CH_2-COOM,



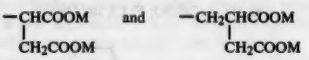
and —$(CH_2)_2N(CH_2COOM)_2$ when n is 0 and m is 2, and R is selected from a group consisting essentially of



and $(CH_2)_zNH_pR'_q$ when n is 1 and m is 1, p has a value of 0 or 1, q has a value of 1 or 2 and the sum of p+q is 2 wherein R' is selected from a group consisting of



when p is 1 and q is 1 and R' is selected from a group consisting of —CH_2COOM, —CH_2CH_2COOM,



when p is 0 and q is 2, wherein M and Z have the same meaning as set forth above.

4,344,861

BIS-AMIDES AS CORROSION INHIBITORS

Joseph Levy, Deerfield Beach, Fla., assignor to UOP Inc., Des Plaines, Ill.

Filed Jan. 15, 1980, Ser. No. 112,364
Int. Cl.³ C23F 11/12, 11/14, 11/16
U.S. Cl. 252—391 **23 Claims**

1. A method of inhibiting corrosion of metals in contact with petroleum and petroleum fractions other than gasoline comprising contacting surfaces of said metals with a corrosion inhibiting amount of a corrosion inhibitor consisting of the reaction product of about one mole ratio of an amine with about one equivalent of a dicarboxylic acid.

4,344,862

REACTION PRODUCTS OF SULFONAMIDO-CARBOXYLIC ACIDS OR CARBOXAMIDO-CARBOXYLIC ACIDS WITH ALKANOLAMINES, AND THEIR USE AS LOW-FOAMING CORROSION INHIBITORS

Rudi Widder, Leimen; Elmar Getto, Mannheim, and Albert Hettche, Hessheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

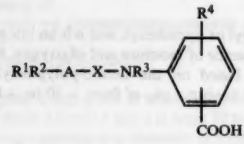
Filed Oct. 20, 1980, Ser. No. 199,059

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1979, 2947418

Int. Cl.³ C23F *11/16, 11/14, 11/12*

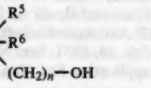
U.S. Cl. 252—391 **4 Claims**

1. A product which is obtained by reacting an acid of the formula I



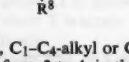
I

where R^1 and R^2 are hydrogen, fluorine, chlorine, bromine or alkyl or alkoxy of 1 to 4 carbon atoms, but the sum of the carbon atoms of R^1 and R^2 is not greater than 7 and preferably not greater than 3, A is a benzene, naphthalene or anthracene radical or a biphenyl structure, R^3 is hydrogen, alkyl of not more than 4 carbon atoms, β-cyanoethyl or hydroxyalkyl of 2 to 4 carbon atoms, R^4 is hydrogen, fluorine, chlorine, bromine, alkyl or alkoxy of 1 to 4 carbon atoms, hydroxyl or carboxyl and X is $—SO_2—$ or —CO—, with an amine of the formula II



II

where R^5 and R^6 are hydrogen, C_1–C_4-alkyl, C_2–C_4-hydroxyalkyl and/or



R^7 and R^8 being hydrogen, C_1–C_4-alkyl or C_2–C_4-hydroxyalkyl and n being an integer from 2 to 4, in the ratio, expressed in terms of equivalents, of from 1:1 to 1:4.

4,344,863

PROCESS FOR DEFOAMING ACID GAS SCRUBBING SOLUTIONS AND DEFOAMING SOLUTIONS

Max L. Robbins, South Orange, and Edwin R. Ernst, Kendall Park, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 930,915, Aug. 4, 1978, Pat. No. 4,208,385. This application Dec. 21, 1979, Ser. No. 105,908

Int. Cl.³ C09K *3/00*

U.S. Cl. 252—192 **9 Claims**

1. An acid gas scrubbing composition composition having a reduced tendency to foam comprising:

(a) an alkaline material comprising a basic alkali metal salt or alkali metal hydroxide,

(b) one or more amino compounds at least one of which contains a hydrophobic moiety,

(c) water, and

(d) from about 1 to about 1500 parts per million by weight of said composition of at least one antifoaming agent comprising a polyoxyethylene polyoxypropylene block copolymer of the general formula:

$$HO(C_2H_4O)_a(C_3H_6O)_b(C_2H_4O)_cH$$

wherein a and c are integers such that the hydrophile portion represented by (C_2H_4O) constitutes from about 10 to about 30 weight percent of the block copolymer and b is an integer such that the hydrophobe represented by (C_3H_6O) has a molecular weight from about 1000 to about 2150.

4,344,864

METHOD FOR INCREASING SHELF-LIFE OF A SERUM CONJUGATED BILIRUBIN REFERENCE COMPOSITION AND COMPOSITION PRODUCED THEREBY

Allan L. Louderback, Temple City, and Thomas J. Foley, Diamond Bar, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Oct. 30, 1980, Ser. No. 202,269

Int. Cl.³ G01N *33/48*

U.S. Cl. 252—408 **20 Claims**

1. An improved blood serum reference composition of the type comprising blood serum having a conjugated bilirubin constitutent of known value, characterized in that said composition possesses a pH of from about 8.2 to about 9.2 and further comprises:

(a) a sulfhydryl compound in an amount sufficient to further enhance the stability of conjugated bilirubin and

(b) a chelating agent in an amount sufficient to bind the metals present in said blood serum.

4,344,865

STEAM REGENERATION OF RHODIUM CONTAINING HYDROCARBON DEHYDROCYCLIZATION CATALYSTS

Russell R. Reinhard, Hopewell Junction; Tansukhlal G. Dorawala, and Edwin R. Kerr, both of Wappingers Falls, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 103,302, Dec. 13, 1979, Pat. No. 4,304,658. This application Feb. 5, 1981, Ser. No. 231,820

Int. Cl.³ B01J *23/96;* **C10G** *35/06, 35/085*

U.S. Cl. 252—420 **10 Claims**

1. The method of regenerating a spent catalyst, having a pH of less than about 8 containing a porous support bearing a catalytic amount of rhodium, which has been used to steam dehydrocyclize a steam dehydrocyclizable hydrocarbon at steam dehydrocyclization conditions which comprises steaming said spent catalyst at 800° F.–1200° F. for 12–48 hours thereby forming regenerated catalyst; and recovering said regenerated catalyst.

5. The method of claim 1 wherein said catalyst contains chromium.

8. The method of claim 1 wherein said catalyst contains a non-noble Group VIII metal.

4,344,866

CARBONYLATION OF OLEFINICALLY UNSATURATED COMPOUNDS

Frederick A. Pesa, Aurora, and Thomas A. Haase, Twinsburg, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

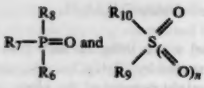
Division of Ser. No. 89,822, Oct. 31, 1979, Pat. No. 4,313,893, which is a division of Ser. No. 973,069, Dec. 26, 1978, abandoned. This application Jul. 30, 1981, Ser. No. 288,553

Int. Cl.³ B01J *31/02*

U.S. Cl. 252—428 **6 Claims**

1. A catalyst composition comprising a phosphorus or sulfur oxide promoter ligand and at least one of cobalt carbonyl and

ruthenium carbonyl wherein said promoter ligand has one of the following structures:



wherein R_6, R_7, R_8, R_9, and R_{10} are each independently selected from:

(1) C_{1-10} alkyls;

(2) polynuclear aryls containing up to 12 carbon atoms, optionally substituted with C_{1-10} alkyls; and

(3) $O(CH_2)_tCH_3$, wherein t is 0–10; and

wherein n is 0 or 1.

4,344,867

HYDROPROCESSING CATALYSTS

Neville L. Cull, Baker, and Willard H. Sawyer, Baton Rouge, both of La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 13, 1979, Ser. No. 65,958

Int. Cl.³ B01J *21/04, 23/85, 23/88, 27/04*

U.S. Cl. 252—439 **13 Claims**

1. A catalyst comprising at least one Group VIB metal component and at least one Group VIII metal component composited with a support, said support having been prepared by the steps which comprise:

(a) treating alpha alumina monohydrate with an acidic solution having a pH of less than about 3, said acid solution comprising a hydrolyzable zirconium salt;

(b) reacting the product resulting from step (a) with a neutralizing agent;

(c) calcining the product resulting from step (b), and

(d) recovering a catalyst comprising a Group VIB metal component, a Group VIII metal component, and a support, said support comprising a zirconium component and gamma alumina.

4,344,868

CATALYST FOR SYNTHESIS GAS CONVERSION TO OXYGENATES

Clarence D. Chang, Princeton, and William H. Lang, Pennington, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 65,821, Aug. 13, 1979, abandoned. This application Apr. 7, 1980, Ser. No. 137,943

Int. Cl.³ B01J *29/32*

U.S. Cl. 252—455 Z **12 Claims**

1. A catalyst composition for use in converting synthesis gas into oxygenate-containing mixtures, which comprises a zeolite which is virtually free of acid sites and which has an acid activity, as measured by the C.P.I. Index, of no greater than 50, and characterized by a silica to alumina mole ratio of at least about 12, a constraint index within the range of 1 to 12, having intimately combined therewith a metal selected from the group consisting of rhodium, platinum, palladium and iridium.

4,344,869

PREPARATION OF ELECTRICALLY CONDUCTIVE HETERO-POLY-PHENYLENES

Gerd Blinne, Bobenheim; Herbert Naarmann, Wattenheim, and Klaus Penzien, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

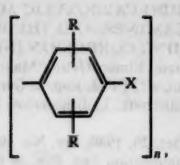
Filed Feb. 24, 1981, Ser. No. 237,635

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1980, 3009351

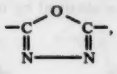
Int. Cl.³ H01B *1/00*

U.S. Cl. 252—517 **5 Claims**

1. A process for the preparation of electrically conductive hetero-polyphenylenes having conductivities greater than 10^{-2}S/cm which comprises: adding to a hetero-polyphenylene of the formula



where X is S, O, NH, Se, SO_2, or



R is H, CH_3, phenyl or cyclohexyl, and n is an integer of from 2 to 200, in the absence of moisture and of oxygen, from 0.5 to 35% by weight, based on the hetero-polyphenylene, of a strong Lewis acid having a pk_a of from −10 to +14.

4,344,870

PREPARATION OF ELECTRICALLY CONDUCTIVE HETERO-POLYAROMATICS

Gerd Blinne, Bobenheim; Herbert Naarmann, Wattenheim, and Klaus Penzien, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

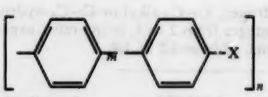
Filed Feb. 24, 1981, Ser. No. 237,636

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1980, 3009350

Int. Cl.³ H01B *1/00*

U.S. Cl. 252—517 **5 Claims**

1. A process for the preparation of electrically conductive hetero-polyaromatics having conductivities greater than 10^{-2} S/cm which comprises: adding to a hetero-polyaromatic of the formula

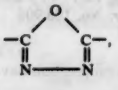


I

ps or the formula

$$[K-X]_m \qquad \text{II}$$

where X is SO_2, S, O, NH, Se or



K is naphthalene, anthracene, perylene or coronene, m is from 1 to 5, preferably from 1 to 2, and n is from 5 to 1,000, preferably from 5 to 500, in the absence of moisture and of oxygen, from 0.5 to 35 percent by weight, based on the weight of the hetero-polyaromatic, of a strong Lewis acid having a pk_a of from −10 to +4.

4,344,871

SPRAY-DRIED ALUMINOSILICATE DETERGENTS CONTAINING SILICATE AND METABORATE

Philip N. Allaway; Richard M. Baginski; Don K. K. Liu, and Theodore M. Teixeira, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 23, 1981, Ser. No. 246,824

Int. Cl.³ C11D *3/02, 3/08, 3/12, 11/00*

U.S. Cl. 252—531 **9 Claims**

1. A dried granular detergent composition prepared by drying an aqueous slurry comprising:

(a) from about 5% to about 40% of a water-soluble organic surface active agent selected from the group consisting of anionic, nonionic, zwitterionic, and ampholytic detergents, and mixtures thereof;

(b) from about 10% to about 60% of a finely divided aluminosilicate ion exchange material selected from the group consisting of:

(1) crystalline aluminosilicate material of the formula:

$$Na_z[(AlO_2)_z.(SiO_2)_y].xH_2O$$

wherein z and y are at least 6, the molar ratio of z and y is from 1.0 to 0.5 and x is from 10 to 264, said material having a particle size diameter of from about 0.1 micron to about 10 microns, a calcium ion exchange capacity of at least about 200 mg. $CaCO_3$ eq./g. and a calcium ion exchange rate of at least about 2 grains Ca^{++}/gallon/-minute/gram/gallon;

(2) amorphous hydrated alumiosilicate material of the empirical formula:

$$M_z(zAlO_2.ySiO_2)$$

wherein M is sodium, potassium, ammonium, or substituted ammonium, z is from about 0.5 to about 2, y is 1 and said material has a magnesium ion exchange capacity of at least about 50 milligram equivalents of $CaCO_3$ hardness per gram of anhydrous aluminosilicate and a Mg^{++} exchange rate of at least about 1 grain/gallon/-minute/gram/gallon and

(3) mixtures thereof; and a mixture of a water-soluble alkali metal silicate and alkali metal borate equivalent to

(c) from about 2.0% to about 15% of an alkali metal oxide silicate solid having a weight ratio of SiO_2:alkali metal oxide of from about 0.8:1 to about 2.3:1; and

(d) an alkali metal metaborate to provide a B_2O_3:SiO_2 weight ratio of from about 0.1 to about 4.0.

2. The composition of claim **1** wherein water is removed from the slurry by spray drying.

9. The composition of claims **2**, **3**, or **4** wherein said water-soluble organic surface active agent is selected from the group consisting of linear alkylbenzene sulfonate, alkyl sulfate, alkyl ethoxy ether sulfate, and mixtures thereof, said alkyl groups containing from about 10 to about 20 carbon atoms and said alkyl ethoxy ether sulfate having an average degree of ethoxylation of from about 1 to about 4 moles of ethylene oxide per mole of alkyl sulfate.

4,344,872

METHOD AND APPARATUS FOR REMOVING WASTE PRODUCTS FROM SOLUTIONS OF FISSION PRODUCTS

Dietrich Thiele, Jülich-Stetternich, Fed. Rep. of Germany, assignor to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Fed. Rep. of Germany

Filed Jul. 12, 1979, Ser. No. 56,939

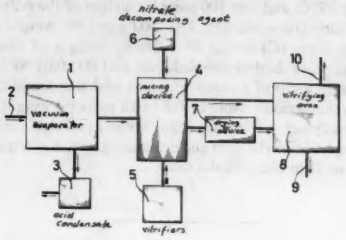
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1978, 2831316

Int. Cl.³ G21F *9/16, 9/08*

U.S. Cl. 252—629 **6 Claims**

1. A method of removing fission products from ruthenium-containing nitric acid solutions and thereafter isolating the fission products in a solid mass, the method comprising in combination the steps of:

concentrating said solution by evaporation of the nitric acid therefrom to form a fission products concentrate having a solids content in the range of fifteen to twenty-five percent by exposing the solution to a partial vacuum having a pressure below fifty millimeters of mercury and by maintaining the temperature of the solution at a level sufficient to ensure evaporation of the nitric acid at that pressure whereby the evaporated nitric acid has a ruthenium content below one part per million;



condensing the nitric acid vapor having a ruthenium content below one part per million;

separating the nitric acid condensate from the fission products concentrate;

adding vitrifiers and ammonia derivatives capable of nitrous-free nitrate decomposition to the fission products concentrate to form a fission product-vitrifier mixture with a reduced nitrate content, and

heating in an oven the fission product-vitrifier mixture to vitrify same and to thereby isolate the fission products in a solid mass.

4,344,873

POTTING MEDIUM FROM POLYURETHANES

Gerhard Wick, Obernburg, Fed. Rep. of Germany, assignor to Akzo NV, Arnhem, Netherlands

Filed Mar. 13, 1981, Ser. No. 243,342

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1980, 3010030

Int. Cl.³ C08L *91/00;* **C08G** *18/24, 18/75, 18/77*

U.S. Cl. 528—58 **39 Claims**

1. A potting medium comprising

a polymer including groups derived from reacting castor oil, trimethylolpropane and a diisocyanate based on a carbon ring compound; and

a dialkyltin compound in an amount of from about 5 to 50 ppm calculated for elementary tin based on the total weight of potting medium.

19. A method for production of a potting medium comprising

adding to at least one of the ingredients employed a dialkyltin compound in an amount resulting in a content of the potting medium of from about 5 to 50 ppm calculated for elementary tin;

reacting a diisocyanate based on a carbon ring compound in stochiometric excess with a mixture of castor oil and trimethylolpropane to a prepolymer having NCO-groups; and mixing the prepolymer with castor oil for crosslinking.

4,344,874
POLYETHYLENE TEREPHTHALATE RESIN COMPOSITIONS

Noriyuki Akagi; Yoshinari Ogawa, and Kouichi Sakai, all of Sagamihara, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Apr. 28, 1981, Ser. No. 258,302

Claims priority, application Japan, Apr. 28, 1980, 55/55482; Jun. 4, 1980, 55/74189

Int. Cl.³ C08K 5/12

U.S. Cl. 524—296 14 Claims

1. A polyethylene terephthalate resin composition consisting essentially of (A) a polyethylene terephthalate resin having an intrinsic viscosity of 0.35 to 0.9 as measured in ortho-chlorophenol at 35° C. and, per 100 parts by weight of the polyethylene terephthalate resin, (B) 5 to 200 parts by weight of an inorganic filler, (C) 0.1 to 20 parts by weight of dimethyl terephthalate or diethyl terephthalate and (D) 0.01 to 5 parts by weight of a salt of a carboxylic acid with a metal of Group I or II in the periodic table or 0.1 to 10 parts by weight of an ionic copolymer of an α-olefin with a salt of an α,β-unsaturated carboxylic acid and containing an ion of a metal of Group I or II in the periodic table.

4,344,875
ORGANOTIN ANTIFOULING COATING WITH EPOXY AND POLYACRYLATE COMPOSITIONS

Albert R. Parks, Glen Burnie, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 26, 1981, Ser. No. 277,455

Int. Cl.³ C08K 3/00

U.S. Cl. 424—78 5 Claims

1. A marine antifouling coating formulation consisting essentially of, by weight:

from about 20% to about 55% of the esterification product produced by reacting tributylin oxide with a copolymer of styrene and maleic anhydride, wherein from about 0.4 to about 0.8 moles of said oxide are combined with each mole of said copolymer;

from about 5% to about 28% solvent;

from about 25% to about 55% of a diglycidyl ether of Bisphenol A epoxy compound;

from about 7% to about 15% of an acrylic or methacrylic acid ester of an aliphatic polyhydric alcohol;

from about 5% to about 10% of an aliphatic amine curing agent;

from about 2% to about 6% filler; and

from about 2% to about 6% pigment.

4,344,876
STABILIZATION OF ACID CATALYZED STOVING LACQUERS

Godwin Berner, Rheinfelden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 47,407, Jun. 11, 1979, abandoned. This application Nov. 28, 1980, Ser. No. 211,480

Claims priority, application Switzerland, Jun. 21, 1978, 6752/78

Int. Cl.³ C09D 3/28, 3/81

U.S. Cl. 524—91 19 Claims

1. A composition of matter consisting of an acid-catalysed stoving lacquer based on hot crosslinkable acrylic, polyester or alkyd resins and stabilised with a N-substituted 2,2,6,6-tetraalkylpiperidine compound or its acid addition salt.

4,344,877
BICYCLO 4-ACYLOXYPIPERIDINE LIGHT STABILIZERS

Erwin Nikles, Liestal, and Friedrich Karrer, Zofingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

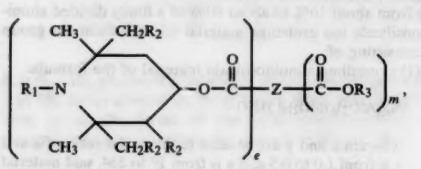
Continuation of Ser. No. 92,890, Nov. 9, 1979, abandoned, which is a continuation of Ser. No. 880,662, Feb. 23, 1978, abandoned. This application Jan. 14, 1981, Ser. No. 224,859

Claims priority, application Switzerland, Feb. 24, 1977, 2309/77

Int. Cl.³ C08K 5/34; C07D 401/14, 401/12

U.S. Cl. 524—102 9 Claims

1. A 4-acyloxypiperidine compound of formula I



(I)

in which R_1 denotes C_1–C_{30}-alkyl; C_3–C_{20}-alkenyl; C_3–C_{20}-alkynyl; C_2–C_{30}-cyanoalkyl; C_2–C_{30}-alkoxyalkyl; benzyl, α-phenylethyl, or said benzyl or said α-phenylethyl substituted by C_1–C_8-alkoxy; 2,3-epoxypropyl; C_1–C_{20}-alkanoyl; C_2–C_{20}-alkenoyl; benzoyl, phenylacetyl, phenylpropionyl or said benzoyl, said phenylacetyl or said phenylpropionyl substituted on the phenyl ring by two C_1–C_8-alkyl and by a hydroxyl group; pyridylcarbonyl; or one of the groups $—CH_2COOR_4$, $—CH_2—CH(R_5)—OR_6$, $—COOR_7$ or $—CONHR_7$, in which R_4 is C_1–C_{12}-alkyl, C_3–C_6-alkenyl, phenyl, benzyl, α-phenylethyl or cyclohexyl and R_5 is hydrogen, methyl or phenyl and R_6 denotes hydrogen; C_1–C_{18}-alkanoyl; acryloyl; hexahydrobenzoyl; benzoyl, phenylacetyl, phenylpropionyl, or said benzoyl, said phenylacetyl or said phenylpropionyl substituted on the phenyl ring by chlorine, by C_1–C_4-alkyl, by C_1–C_8-alkoxy, by hydroxyl or by mixtures of said substituents; or cinnamoyl, and R_7 denotes C_1–C_{12}-alkyl, cyclohexyl, phenyl or benzyl, R_2 is hydrogen or C_1–C_8-alkyl, R_3 is C_1–C_{30}-alkyl, C_1–C_{30}-hydroxyalkyl, C_2–C_{30}-cyanoalkyl, C_2–C_{30}-alkoxyalkyl, C_3–C_{30}-alkoxycarbonylalkyl, C_3–C_{20}-alkenyl, C_3–C_{20}-alkynyl, C_3–C_{12}-cycloalkyl, phenyl; or benzyl, α-phenylethyl or said benzyl or said α-phenylethyl substituted by C_1–C_8-alkoxy, Z is a divalent or tetravalent radical of bicyclo[2.2.1]heptane, bicyclo[2.2.1]hept-5-ene, bicyclo[2.2.2]octane or bicyclo[2.2.2]oct-5-ene or said radical substituted by C_1–C_4-alkyl or chlorine, e is 2 or 4, m is 0 or 2, and e+m is 2 or 4.

9. A process for stabilizing a synthetic polymer subject to degradation by the action of ultraviolet light which comprises incorporating therein an effective amount of a stabilizer compound according to claim 1.

4,344,878
FLAME RETARDANT, NON-DRIPPING LINEAR POLYESTER COMPOSITIONS

Thomas J. Dolce, Stirling, N.J., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 125,214, Feb. 27, 1980, abandoned, which is a continuation of Ser. No. 638,806, Dec. 8, 1975, abandoned. This application Feb. 19, 1981, Ser. No. 226,412

Int. Cl.³ C08K 5/59

U.S. Cl. 524—409 8 Claims

1. A flame retardant, non-dripping thermoplastic molding composition which consists essentially of:

(a) a linear polyester resin;

(b) a flame retardant amount of a flame retardant additive consisting essentially of a halogen containing polycarbonate in admixture with antimony oxide; and

(c) an amount of polytetrafluoroethylene resin that is sufficient to render the composition non-dripping.

4,344,879

QUATERNARY AND BASIC AZAMETHINE COMPOUNDS AND THEIR USE AS COLORANTS

Reinhard Mohr, Offenbach am Main, and Manfred Hähnke, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

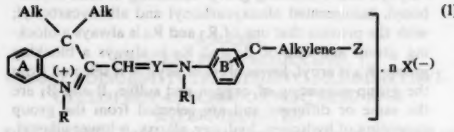
Filed Nov. 5, 1980, Ser. No. 204,323

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1979, 2945028

Int. Cl.³ C07D *209/14;* C07B *23/16*

U.S. Cl. 260—146 R **6 Claims**

1. An azamethine compound of the formula (1)



(1)

in which

R is alkyl of from 1 to 4 C atoms, unsubstituted or substituted by carbamoyl, alkanoyloxy of from 1 to 4 C atoms, carbalkoxy of from 1 to 4 C atoms in the alkyl moiety, hydroxy, cyano or phenyl,

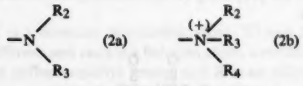
Alk is alkyl of from 1 to 4 C atoms, the two radicals Alk are identical to each other or different from one another,

Y is methine or nitrogen,

R_1 is hydrogen or alkyl of from 1 to 4 C atoms, unsubstituted or substituted by carbamoyl, alkanoyloxy of from 1 to 4 C atoms, carbalkoxy of from 1 to 4 C atoms in the alkyl moiety, hydroxy, cyano or phenyl,

Alkylene is a straight-chain or branched alkylene of from 2 to 6 C atoms,

Z is a group of the formula (2a) or (2b)



(2a) (2b)

in which R_2 is alkyl of from 1 to 4 C atoms, unsubstituted or substituted by carbamoyl, alkanoyloxy of from 1 to 4 C atoms, carbalkoxy of from 1 to 4 C atoms in the alkyl moiety, hydroxy, cyano or phenyl,

R_3 is alkyl of from 1 to 4 C atoms, unsubstituted or substituted by carbamoyl, alkanoyloxy of from 1 to 4 C atoms, carbalkoxy of from 1 to 4 C atoms in the alkyl moiety, hydroxy, cyano or phenyl, or R_3 is phenyl unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of chlorine, alkyl with 1 to 4 C atoms, alkoxy with 1 to 4 C atoms, nitro, carbalkoxy with 1 to 4 C atoms in the alkyl moiety and carbamoyl, and

R_4 is hydrogen, or alkyl of from 1 to 4 C atoms, unsubstituted or substituted by carbamoyl, alkanoyloxy of from 1 to 4 C atoms, carbalkoxy with 1 to 4 C atoms in the alkyl, hydroxy, cyano or phenyl, or

R_2 and R_3, together with the nitrogen atom, form the piperidino, piperazino or morpholino radical, or

R_2 and R_3 or R, R and R, together with the positively charged nitrogen atom, form the piperidinium, morpholinium, piperazinium, 4-N-methylpiperazinium or pyridinium radical,

the benzene nucleus A is unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of halogen, nitro, cyano, sulfamoyl, alkyl with 1 to 4 C atoms, alkoxy with 1 to 4 C atoms and carbalkoxy with 1 to 4 C atoms in the alkyl,

the benzene nucleus B is unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of halogen, nitro, alkyl with 1 to 4 C atoms, alkoxy with 1 to 4 C atoms and carbalkoxy with 1 to 4 C atoms in the alkyl,

n is the number 1 or 2,

and $X^{(-)}$ is the equivalent of a colorless anion.

4,344,880

DISAZO DYESTUFFS HAVING AN ACYLAMINO GROUP AND AN AROMATIC-OXY GROUP ON DIFFERENT TERMINAL MOIETIES

Johannes Dehnert, Ludwigshafen, and Werner Juenemann, Bad Durkheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

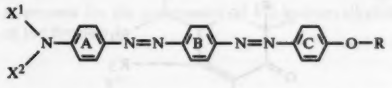
Filed Nov. 3, 1980, Ser. No. 203,809

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1979, 2948456

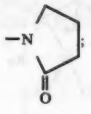
Int. Cl.³ C07C *107/04;* C09B *43/128, 43/132, 43/28*

U.S. Cl. 260—152 **9 Claims**

1. A disazo dye of the formula:



wherein R is an araliphatic or aromatic radical, X^1 is —CO—R^1, —COOR^1 or —CO—N(R^1)$_2$, wherein said R^1 radical independently are hydrogen or an aliphatic, cycloaliphatic, araliphatic or aromatic radical; X^2 is hydrogen, phenyl or an aliphatic or araliphatic radical; or X^1 and X^2 form a heterocyclic radical of the formula



rings A, B and C optionally being substituted and rings B and C optionally being fused with a benzo ring.

4,344,881

PROCESS FOR MAKING ALKYLENE CARBONATES

Paul E. Strege, and James M. Renga, both Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 2, 1981, Ser. No. 230,212

Int. Cl.³ C07D *317/38, 317/36*

U.S. Cl. 549—229 **11 Claims**

1. A process for making a cyclic alkylene carbonate which comprises heating a mixture of a lower alkyl trichloroacetate with about a molar equivalent of a vicinal alkylene diol in the presence of a small but effective amount of a base selected from the group consisting of an alkali metal alkoxide, a salt of a strong base and a weak acid, and a non-nucleophilic organic base at about 100° C.–250° C., thereby causing the formation and substantial distillation of chloroform and lower alkanol from said mixture and separating the alkylene carbonate product from the residual mixture.

4,344,882

INTERMEDIATE COMPOUNDS IN THE PREPARATION OF SPECTINOMYCIN

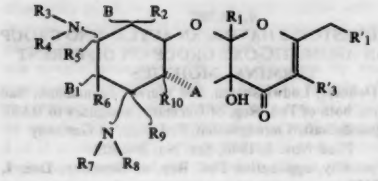
David R. White, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 68,926, Aug. 23, 1979, Pat. No. 4,282,152. This application Dec. 4, 1980, Ser. No. 212,950

Int. Cl.³ C07D *319/24, 327/08*

U.S. Cl. 549—387 **3 Claims**

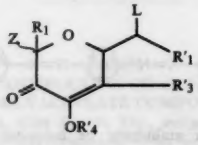
1. A process for preparing a compound having the formula



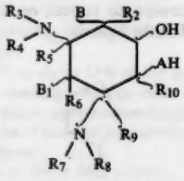
Ia

which comprises

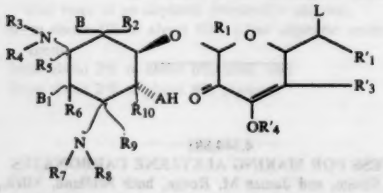
(a) reacting a compound having the formula



with a compound having the formula

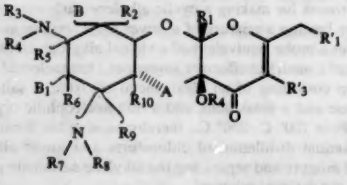


to prepare a compound having the formula



IV

(b) reacting the compound prepared in step A with a base system to prepare a compound having the formula



and

(c) hydrolyzing the compound prepared in step (b) to the compound of formula Ia;

wherein R'_1 through R'_3 may be the same or different and are selected from the group consisting of hydrogen, lower alkyl, acyloxyalkyl, lower haloalkyl, lower aminoalkyl, lower alkenyl, lower alkynyl, —OX and (CH_2)n-OX and isomers thereof with the proviso that R'_1, and R'_3 are not hydroxy;

wherein X is selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, and lower alkynyl,

n is an integer of from one to four;

R_1 is hydrogen or lower alkyl;

wherein R_2, R_5, R_6, R_9 and R_{10} are selected from the group consisting of hydrogen, lower alkyl, lower alkenyl and lower alkynyl; R_3, R_4, R_7 and R_8 are selected from the group consisting of lower alkyl, lower alkenyl, lower alkynyl, and a blocking group consisting of aralkoxycarbonyl, halogenated alkoxycarbonyl and alkoxycarbonyl; with the proviso that one of R_3 and R_4 is always a blocking group and one of R_7 and R_8 is always a blocking group; R'_4 is aroyl, lower alkyl or acyl; A is selected from the group consisting of oxygen and sulfur, B and B_1 are the same or different and are selected from the group consisting of hydrogen, hydroxy, alkoxy, o-lower alkenyl, thio, thio-lower alkyl and thio lower alkenyl; Z is halo and L is a leaving group such as acyloxy, halo, o-sulfonate, nitro and other groups that can generate unsaturation in the ring by elimination.

4,344,883

PRODUCTION OF N-CHLOROSULFINYLCARBAMATE ESTERS

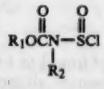
Mohamed A. H. Fahmy, and Tetsuo R. Fukuto, both of Riverside, Calif., assignors to The Regents of the University of California, Los Angeles, Calif.

Division of Ser. No. 18,416, Mar. 7, 1979, Pat. No. 4,261,897. This application Oct. 6, 1980, Ser. No. 194,759

Int. Cl.³ C07D *317/64, 307/86;* **C07C** *149/437, 131/00*

U.S. Cl. 549—467 **19 Claims**

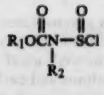
1. Process for preparing N-chlorosulfinylcarbamates having the formula:



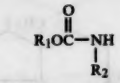
which comprises reacting a compound having the formula:

wherein R_1 is selected from the group consisting of a hydrocarbyl group containing from 1 to 20 carbon atoms, a 5 to 6 membered heterocyclic ring containing O or S atoms, and the >C=N— group, and R_2 is a hydrocarbyl group containing from 1 to 12 carbon atoms, with thionyl chloride, the reaction being carried out in the presence of an organic solvent and a hydrogen chloride acceptor.

5. Process for preparing N-chlorosulfinylcarbamates having the formula:



which comprises reacting a compound having the formula:



wherein R_1 is selected from the group consisting of a hydrocarbyl group containing from 1 to 20 carbon atoms, a 5 to 6 membered heterocyclic ring containing O or S atoms, and the >C═N— group, and R_2 is a hydrocarbyl group selected from the group consisting of straight chain, branched and carbocyclic (five or six membered ring) alkyl, or phenylaklyl, and containing from 1 to 12 carbon atoms, with thionyl chloride.

4,344,884

PROCESS FOR PRODUCING CIS-3-(2,2-DISUBSTITUTED-ETHENYL)-2,2-DIMETHYL-CYCLOPROPANECARBOXYLIC ACID AND INTERMEDIATES

Kiyoshi Kondo; Toshiyuki Takashima, and Minoru Suda, all of Kanagawa, Japan, assignors to FMC Corporation, Philadelphia, Pa.

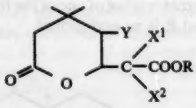
Division of Ser. No. 90,218, Nov. 1, 1979, Pat. No. 4,237,058. This application Jun. 30, 1980, Ser. No. 164,624

The portion of the term of this patent subsequent to Aug. 3, 1999, has been disclaimed.

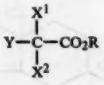
Int. Cl.³ C07D *307/93, 309/30;* C07C *61/04*

U.S. Cl. 549—273 **8 Claims**

1. A process for preparing a compound of the formula



wherein Y is a bromine or chlorine atom, X^1 and X^2 are the same or different and each is a halogen atom, a trichloromethyl group, or a trifluoromethyl group, and R is an alkyl group of 1 to 4 carbon atoms, with the proviso that Y is a bromine atom when at least one of X^1 and X^2 is a bromine atom, which comprises reacting 3,4-dihydro-4,4-dimethyl-2H-pyran-2-one with an alkyl haloacetate of the formula



in the presence of an addition catalyst selected from free radical initiators, light, a transition metal salt, and a transition metal salt/amine complex.

4,344,885

INTERMEDIATE FOR THE PREPARATION OF THIENAMYCIN

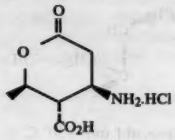
Thomas M. H. Liu, Westfield; David G. Melillo, Scotch Plains; Kenneth M. Ryan, Clark; Ichiro Shinkai, Westfield, and Meyer Sletzinger, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 112,058, Jan. 14, 1980, abandoned. This application Apr. 17, 1981, Ser. No. 255,193

Int. Cl.³ C07D *309/30*

U.S. Cl. 549—291 **1 Claim**

1. A compound having the structure:



4,344,886

PREPARATION OF 2-HYDROXYALKYLCHROMANS

Michael Horner, Neustadt, and Axel Nissen, Leimen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

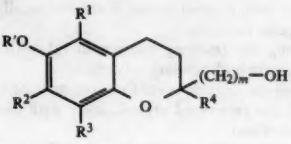
Filed Feb. 26, 1981, Ser. No. 238,608

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1980, 3010504

Int. Cl.³ C07D *311/72*

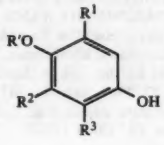
U.S. Cl. 549—408 **2 Claims**

1. A process for the preparation of a 2-hydroxyalkylchroman of the formula I



I

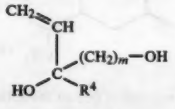
where R^1, R^2, R^3 and R^4 are each H or C_1–C_8-alkyl, R′ is H or an organic radical which can be split off hydrolytically or hydrogenolytically as R′-OH or R′-COOH, and m is 1, 2 or 3, wherein a hydroquinone II



II

is reacted

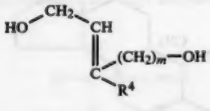
(a) with an alkenediol IIIa



IIIa

or

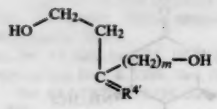
(b) with an alkenediol IIIb



IIIb

or

(c) with an alkenediol IIIc



IIIc

where $R^{4'}$ is methylene, at from −50° C. to 120° C., in an inert solvent, in the presence of from 10 to 300 mole %, based on II, of a Lewis acid or of an adduct of a Lewis acid with a Lewis base which has a lower basicity than compound II.

4,344,887

METHOD FOR EPOXIDIZING OLEFINS

Charles J. Stark, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 107,899, Dec. 28, 1979, abandoned. This application May 15, 1981, Ser. No. 263,839
Int. Cl.³ C07D *301/12*
U.S. Cl. 549—531 **4 Claims**

1. An epoxidation method which comprises,

(1) effecting reaction between an olefinically unsaturated organic material and an aqueous 30–90% by weight hydrogen peroxide solution in the presence of symmetrical tetrachloroacetone, an inert organic solvent and a buffer, where there is used at least 1 mole of tetrachloroacetone per site of olefinic unsaturation in the olefinically unsaturated organic material,

(2) combining the resulting mixture of (1) with an inert $C_{(5-8)}$ aliphatic hydrocarbon solvent,

(3) separating the organic layer from the mixture of (2),

(4) washing the recovered organic layer with an aqueous base solution and

(5) distilling the washed organic layer to effect recovery of the epoxidized organic material from (3).

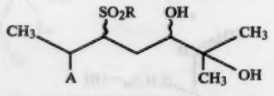
4,344,888

24,25-DIHYDROXYCHOLESTANS AND PROCESS FOR PREPARING THE SAME

Hiroaki Takayama, Tokyo; Sachiko Yamada, Hachioji, and Masayuki Ohmori, Kanagawa, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

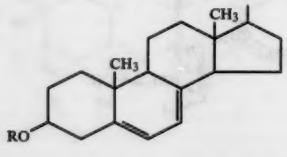
Filed Jul. 27, 1981, Ser. No. 287,052
Claims priority, application Japan, Aug. 5, 1980, 55-106774
Int. Cl.³ C07J *17/00*
U.S. Cl. 260—397.2 **8 Claims**

1. A 24,25-dihydroxycholestane derivative of the formula:



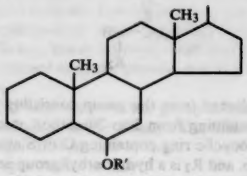
(wherein A is a steroid residue of one of the following formulas (a), (b) and (c), and R is an aryl group)

(a)



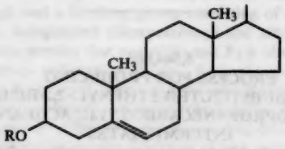
(wherein R is a protecting group for hydroxyl group);

(b)



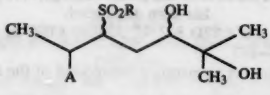
(wherein R′ is a lower alkyl group); and

(c)



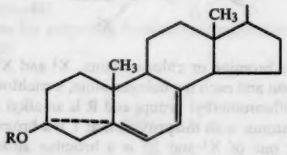
(wherein R is a protecting group for hydroxyl group).

4. A process for producing a 24,25-dihydroxycholestane derivative of the formula:



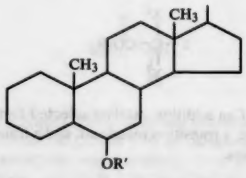
(wherein A is a steroid residue of one of the following formulas (a), (b) and (c), and R is an aryl group)

(a)

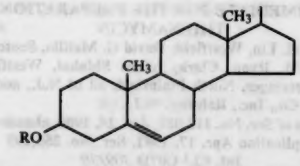


(wherein R is a protecting group for hydroxyl group);

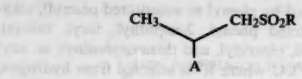
(b)



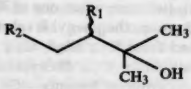
(wherein R′ is a lower alkyl group); and



(wherein R is a protecting group for hydroxyl group) which comprises reacting a compound of the formula:



(wherein A and R are the same as defined above) with a compound of the formula:



4,344,889

PROCESS FOR THE CONTINUOUS PREPARATION OF SULFONATES DERIVED FROM MOLECULES HAVING LONG ALKYL CHAINS AND, MORE PARTICULARLY, SULFONATES DERIVED FROM FATTY ESTERS

Nicolas Inchauspe, Arthez de Bearn, France, assignor to Dumas et Inchauspe, Pau, France

Filed Jan. 9, 1981, Ser. No. 223,750
Claims priority, application France, Jan. 10, 1980, 80 00521
Int. Cl.[3] C07C *143/90*; C11D *1/28*
U.S. Cl. 260—400 9 Claims

1. Process for the continuous preparation of sulfonic acids by sulfonating a starting material selected from the group consisting of methyl esters of fatty acids and mixtures thereof, which process comprises the steps of subjecting the said starting material to a sulfonation carried out by sulfo-oxidation under irradiation, degassing the product and extracting the sulfonic acids so obtained by repeated treatment with slightly aqueous methanol in order to obtain, on the one hand, a phase containing the unsulfonated starting material which is returned to the sulfonation step and, on the other hand, a phase which contains the sulfonic acids and which is subjected to evaporation in order to separate the methanol from the sulfonic acids, said extraction being performed at a temperature between 35° and 50° C.

4,344,890

AQUEOUS FUNGICIDAL FORMULATIONS AND THEIR PREPARATION

John B. Adams, Jr., R.D. #2, Box 40, Hockessin, Del. 19707

Continuation of Ser. No. 143,816, Apr. 23, 1980, abandoned. This application May 4, 1981, Ser. No. 259,955
Int. Cl.[3] C07F *11/00, 3/06*
U.S. Cl. 260—429 K 9 Claims

1. In a process for preparing a stabilized aqueous composition of maneb by reacting a disodium, dipotassium, or diammonium salt of ethylenebis(dithiocarbamic acid) with a water-soluble manganese(II) salt in aqueous medium to precipitate maneb, and recovering the maneb, the improvement which comprises mixing the maneb in an aqueous medium with about 0.05–5.0% by weight of formaldehyde and about 0.05–5.0% by weight (based on Zn) of a soluble zinc salt.

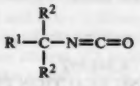
4,344,891

HALOGENATED TERTIARY ALKYL ISOCYANATES AND THEIR PREPARATION

Karl-Heinz Koenig, Frankenthal; Volker Schwendemann, Wiesenbach, and Karl-Heinz Feuerherd, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

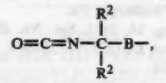
Filed Sep. 8, 1980, Ser. No. 185,404
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1979, 2937062
Int. Cl.[3] C07C *119/042, 119/045*
U.S. Cl. 260—453 A 8 Claims

1. A process for the preparation of halogenated tertiary alkyl isocyanates of the formula

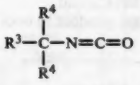


I

where R^1 is R^2 or

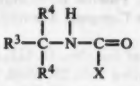


and the individual radicals R^2 are identical or different and each is haloalkyl or halogen-free alkyl of 1 to 6 carbon atoms, and two radicals R^2 bonded to the same carbon atom may also be members of a halogen-free or halogenated alicyclic ring, B is halogen-free alkylene or haloalkylene of 1 to 6 carbon atoms, and one or more of the radicals R^2 possess one or more halogen atoms, by halogenation of isocyanates or carbamic acid chlorides, wherein a tertiary alkyl isocyanate of the formula



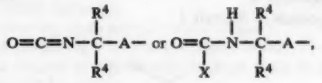
II

or a tertiary carbamic acid halide of the formula



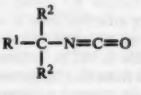
III

where R^3 is R^4- or



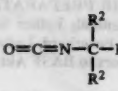
the individual radicals R^4 may be identical or different and each is an aliphatic radical having 1 to 6 carbon atoms and two radicals R^4 bonded to the same carbon atom may also be members of an alicyclic ring, A is alkylene or haloalkylene of 1 to 6 carbon atoms and X is halogen, is reacted with halogen, sulfuryl chloride and/or sulfuryl bromide.

2. A halogenated tertiary alkyl isocyanate of the formula



I

where R^1 is R^2 or



and the individual radicals R^2 are identical or different and each is haloalkyl or halogen-free alkyl of 1 to 6 carbon atoms, and two radicals R^2 bonded to the same carbon atom may also be members of a halogen-free or halogenated alicyclic ring, B is halogen-free alkylene or haloalkylene of 1 to 6 carbon atoms, and one or more of the radicals R^2 possess one or more halogen atoms, and the total number of halogen atoms, if R^1 is R^2- and all 3 radicals R^2 together contain 3 carbon atoms, is not less than 4.

4,344,892
SELF-GRANULATING REACTION PRODUCT OF 4,4'-DIPHENYLMETHANE DIISOCYANATE AND RESORCINOL

Frank Sanns, Jr., Upper St. Clair, Pa., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Aug. 14, 1981, Ser. No. 292,967
Int. Cl.³ C07C *119/048*
U.S. Cl. 260—453 AM **8 Claims**

1. A free-flowing, dry, granular powder comprising the reaction product of 4,4'-diphenylmethane diisocyanate and resorcinol, the product having an isocyanate group content of from 27 to 31% by weight.

6. A process for the preparation of a free-flowing, dry, granular powder comprising:

(i) reacting 4,4'-diphenylmethane diisocyanate with resorcinol at a temperature of from 40° to 80° C. in the presence of a catalytic amount of a material which catalyzes the reaction between isocyanate groups and hydroxyl groups,

(ii) allowing the reaction mixture to exotherm to a temperature no higher than 90° C., and

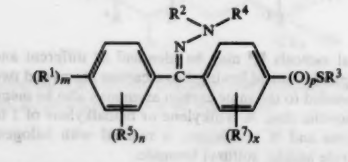
(iii) allowing the resultant product to cool to room temperature.

4,344,893
PESTICIDE COMPOUNDS

Leonard G. Copping; John C. Kerry; Thomas I. Watkins; Robert J. Willis, and Bryan H. Palmer, all of Nottingham, England, assignors to The Boots Company Limited, Nottingham, England

Continuation-in-part of Ser. No. 15,011, Feb. 26, 1979, abandoned. This application Feb. 25, 1980, Ser. No. 124,183
Claims priority, application United Kingdom, Mar. 1, 1978, 8002/78; Mar. 1, 1978, 8003/78
Int. Cl.³ C07C *143/68, 133/04, 133/08, 143/74*
U.S. Cl. 260—456 A **10 Claims**

1. Compounds of formula I



I

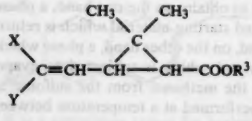
in which m is 0 and n is 0 or m is 1 and n is 0 or 1; p is 0 2 or 3, x is 0 or 1; R^1, R^5 and R^7 are halogen, alkyl, haloalkyl or alkoxy or R^1 and an adjacent R^5 group together with the benzene to which they are attached form a naphthyl group: R^2 and R^4 may be the same or different and are hydrogen; alkyl; an ester group of formula R^8XCO, where X is oxygen or sulphur and R^8 is selected from alkyl (optionally substituted by alkoxy, cycloalkyl, halogen, phenyl, substituted phenyl, naphthyl, phenoxy or substituted phenoxy), cycloalkyl, alkenyl, (optionally substituted by phenyl or substituted phenyl), alkynyl, phenyl, substituted phenyl, 2-naphthyl, furyl, thienyl, pyridyl, morpholinyl, piperidyl, and thiamorpholinyl; an acyl group of formula R^9CO where R^9 is selected from hydrogen, alkyl, (optionally substituted by alkoxy, cycloalkyl, halogen, phenoxy or substituted phenoxy), cycloalkyl, alkenyl (optionally substituted by phenyl or substituted phenyl), alkynyl, phenyl, substituted phenyl, 2-naphthyl, morpholinyl, piperidyl and thiamorpholinyl; (wherein when one of R^8 or R^9 contains a substituted phenyl group, the phenyl is substituted by one or more groups selected from C_{1-4} alkyl, C_{1-4} haloalkyl, nitro, C_{1-4} alkoxy, C_{1-4} alkylthio, C_{1-4} dialkylamino, phenyl and halogen); a carbamoyl group of formula $—CONR^{10}R^{11}$ where R^{10} and R^{11} are the same or different and are hydrogen or alkyl; or R^2 and R^4 together with the nitrogen to which they are attached form the group piperidine, pyrrolidine, thiamorpholine or morpholine; R^3 is alkyl, optionally substituted by halogen; alkenyl; N,N-dialkylamino; or phenyl, optionally substituted by alkyl or halogen; with the proviso that when p is 0, R^2 and R^4 are not both hydrogen.

4,344,894
PROCESS FOR THE PREPARATION OF CYCLOPROPANE CARBOXYLIC ACID ESTERS

Dale A. Laidler, Chester, and David J. Milner, Manchester, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jun. 2, 1980, Ser. No. 156,076
Claims priority, application United Kingdom, Jul. 13, 1979, 7924522
Int. Cl.³ C07C *120/00, 67/347*
U.S. Cl. 260—465 D **1 Claim**

1. A process for the preparation of a compound of the formula:

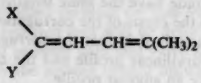


(I)

wherein R^3 is lower alkyl, 3-phenoxybenzyl, α-cyano-3-phenoxybenzyl or α-ethynyl-3-phenoxybenzyl group, and X and Y, which may be the same or different, are fluorine, chlorine, bromine, lower alkyl or $Q(CF_2)_m—$, in which Q is hydrogen, fluorine or chlorinne and m is 1 or 2, or

in which each of U, V and W are independently hydrogen, fluorine or chlorine except that where one of X and Y is a group of formula $Q(CF_2)_m—$ where Q is as defined above, the other of X and Y is fluorine, chlorine or bromine or a group

as previously defined, characterised in that a compound having the formula:



(II)

is reacted with an alkyl diazoacetate $N_2CH.COOR^3$, R^3, X and Y having the prevously defined meanings, in the presence of a catalyst which is the transition metal complex of a chiral Schiff base selected from the group consisting of the compound derived from pyridine-2-carboxaldehyde and S-2-amino-1,1-di-(2-methoxyphenyl)-3-phenylpropan-1-ol, the compound derived from pyridine-2,6-dicarboxaldehyde and S-2-amino-1,1-di-(2-methoxyphenyl)-3-phenylpropan-1-ol, methyl N-salicylidene-4,6-O-benzylidene-2-amino-2-deoxy-alpha-D-altropyranoside, methyl N-(2-hydroxy-1-napthylidene)-4,6-O-benzylidene-2-amino-2-deoxy-alpha-D-altropyranoside, methyl N-(2-pyridinylidene)-4,6-O-benzylidene-2-amino-2-deoxy-beta-D-altropyranoside, methyl N-salicylidene-4,6-O-benzylidene-2-amino-2-deoxy-beta-D-altropyranoside, methyl N-(2-hydroxy-1-naphthylidene)-4,6-O-benzylidene-2-amino-2-deoxy-beta-D-altropyranoside, methyl N-(2-pyridinylidene)-4,6-O-benzylidene-2-amino-2-deoxy beta-D-altropyranoside, methyl N-salicylidene-4,6-O-benzylidene-2-amino-2-deoxy-alpha-D-allopyranoside, methyl N-(2-pyridinylidene)-4,6-O-benzylidene-2-amino-2-deoxy-alpha-D-allopyranoside, methyl N-salicylidene-2-amino-2-deoxy-beta-D-glucopyranoside, methyl N-(2-hydroxy-1-naphthylidene)-2-amino-2-deoxy-beta-D-glucopyranoside, methyl N-(2-pyridinylidene)-2-amino-2-deoxy-beta-D-glucopyranoside, methyl N-salicylidene-2-amino-2-deoxy-alpha-D-glucopyranoside and methyl N-(2-pyridinylidene)-2-amino-2-deoxy-alpha-D-glucopyranoside.

4,344,895

PROCESS FOR THE PREPARATION OF (S) α-CYANO-3-PHENOXY-BENZYL ALCOHOL

Jacques Martel, Bondy; Jean Tessier, Vincennes; Andre Teche, Nanterre, and Jean-Pierre Demoute, Montreuil-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 973,791, Dec. 28, 1978, Pat. No. 4,273,727. This application Apr. 13, 1981, Ser. No. 253,868

Claims priority, application France, Jan. 3, 1978, 78 02621

Int. Cl.³ C07C *121/75*

U.S. Cl. 260—465 F **4 Claims**

1. A process for the preparation of (S) α-cyano-3-phenoxy-benzyl alcohol comprising reacting in the presence of an acid agent (R,S) α-cyano-3-phenoxy-benzyl alcohol and the lactone of cis 2,2-dimethyl-3S-(dihydroxymethyl)-cyclopropane-1R-carboxylic acid to obtain a mixture of (1R,5S) 6,6-dimethyl-4(R)-[(S)-cyano-(3′-phenoxyphenyl)-methoxy]-3-oxa-bicyclo-(3,1,0)-hexan-2-one and (1R,5S) 6,6-dimethyl-4(R)-[(R)-cyano-(3′-phenoxyphenyl)-methoxy]-3-oxa-bicyclo-(3,1,0)-hexan-2-one, separating the two isomers by physical means and hydrolyzing (1R,5S) 6,6-dimethyl-4(R)-[(S)-cyano-(3′-phenoxy-phenyl)-methoxy]-3-oxa-bicyclo-(3,1,0)-hexan-2-one in an acid media to obtain (S) α-cyano-3-phenoxy-benzyl alcohol.

4,344,896

PREPARATION OF 2-CYANOALDEHYDES BY RHODIUM-CATALYZED HYDROFORMYLATION

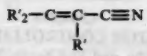
Victor P. Kurkov, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 11,272, Feb. 12, 1979, abandoned. This application Mar. 7, 1980, Ser. No. 128,016

Int. Cl.³ C07C *120/00, 121/34, 121/46*

U.S. Cl. 260—465.1 **8 Claims**

1. A process for preparing 2-cyanoaldehydes by the hydroformylation reaction which comprises contacting an alpha,beta-unsaturated nitrile or mixture of such nitriles with carbon monoxide and hydrogen at a temperature from 130° C. to 250° C. and a combined carbon monoxide-hydrogen pressure of from 50 atmospheres to 500 atmospheres in the presence of a catalytic amount of a catalyst consisting essentially of rhodium in complex combination with carbon monoxide and a ligand; said alpha,beta-unsaturated nitrile being selected from the group consisting of compounds of the structural formula



wherein each R′ is independently selected from the group consisting of hydrogen, saturated alkyl of 1 to 6 carbon atoms or cycloalkyl radicals of 5 to 6 carbon atoms, halide or nitro radicals, said compound having not more than one nitro group; and said ligand being represented by the formula $M[—(O)_n—R]_3$ where M is phosphorus, arsenic or antimony, O is oxygen, n is 0 or 1 and R is a hydrocarbyl radical selected from the group consisting of alkyl of 1 to 20 carbon atoms, aryl of 6 to 14 carbon atoms, alkaryl of 7 to 20 carbon atoms; or aralkyl atoms, and with the proviso that R may optionally be substituted by unreactive substituents; and wherein the molar ratio of 2-cyanoaldehydes to 3-cyanoaldehydes produced is at least of the order of 40 to 1.

4,344,897

PROCESS FOR THE PREPARATION OF PERCARBOXYLIC ACID SOLUTIONS

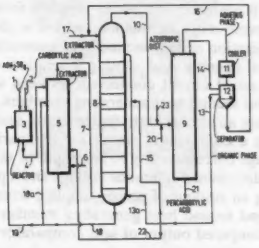
Ralf Goedecke; Willi Hofen, both of Rodenbach; Hermann Seifert, and Gerd Siekmann, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 13, 1979, Ser. No. 102,817

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1978, 2856665

Int. Cl.³ C07C *179/00;* B01D *3/36*

U.S. Cl. 260—502 R **15 Claims**



1. In a process for the continuous preparation of a pure organic solution of a percarboxylic acid having 2 to 5 carbon atoms, which comprises

(a) contacting aqueous hydrogen peroxide with a carboxylic acid containing 2 to 5 carbon atoms in the presence of an acid catalyst at a feed molar ratio of H_2O_2 to carboxylic acid of 0.5:1 to 30:1,

(b) isolating an extract essentially containing the percarboxylic acid and the corresponding carboxylic acid not converted in stage (a), by extracting the reaction mixture obtained according to stage (a) with an organic solvent,

(c) extracting the extract with water or an aqueous solution substantially free of hydrogen peroxide and mineral acid in an extraction unit provided with one to ten theoretical separation stages whereby to obtain an aqueous extract, and

(d) dehydrating the solution of the percarboxylic acid and organic solvent obtained according to (c), by azeotropic distillation to obtain a top product, condensing the top product and separating the resultant condensate into an organic phase and an aqueous phase,

the improvement wherein the organic phase of the top prod-

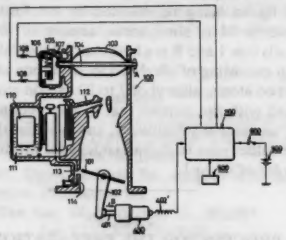
uct of the azeotropic distillation, obtained during the dehydration according to (d), is entirely or partially directly recycled to stage (c) and/or entirely or partially directly recycled to stage (b).

4,344,898

CARBURETOR CONTROLLING SYSTEM

Shigetaka Takada, Obu, and Yoji Satoh, Nagoya, both of Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Obu, Japan

Filed Dec. 10, 1981, Ser. No. 329,588
Int. Cl.³ F02M *1/12*
U.S. Cl. 261—39 E **2 Claims**



1. In combination with a carburetor system having an electrically-heated choke system including a first heat generating member which is heated by the power supplied from a battery and a first thermo-sensitive member which is deformed by the heating operation of said first heat generating member and adapted for controlling an opening and closing operation of a choke valve by the deformation of said first thermo-sensitive member, and a fast idle system adapted for controlling an opening and closing operation of a throttle valve, a carburetor controlling system comprising a second heat generating member which is heated by the power supplied from said battery, a second thermo-sensitive member which is deformed by the heating operation of said second heat generating member and controls an opening and closing operation of said throttle valve, a control circuit connected between said battery and said first and second heat generating members, a thermosensor for detecting an atmospheric temperature, said control circuit comprising a comparator circuit for comparing a compared input voltage corresponding to an output of said thermosensor with a predetermined reference voltage and a power circuit for controlling an amount of power supplied from said battery to said first and second heat generating members in accordance with the compared output of said comparator circuit.

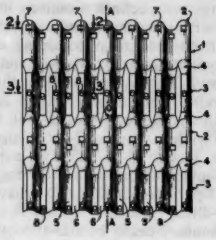
4,344,899

FILL SHEETS FOR GAS AND LIQUID CONTACT APPARATUS

Michel W. J. P. R. Monjoie, Brussels, Belgium, assignor to Hamon Sobelco, S.A., Brussels, Belgium

Filed Oct. 8, 1980, Ser. No. 195,254
Claims priority, application France, Oct. 26, 1979, 79 26636
Int. Cl.³ B01D *47/02*
U.S. Cl. 261—112 **12 Claims**

1. Corrugated fill sheets for a furnishing device comprising liquid fill sheets which are juxtaposed and vertically corrugated and form therebetween passages for a gas, said sheets comprising in succession, in a direction parallel to the crests of the corrugations, at least two regions in which the corrugations have different amplitudes namely a region having corrugations of large amplitude and a region having small amplitude which are interconnected by a transition region, characterized in that said sheets have at intervals along the crests of their corrugations spacer devices by means of which said sheets may be locally fixed to an adjacent sheet and maintained out of contact with the latter except in the region of said spacer devices, further said sheets have a plurality of regions having corrugations of large amplitude alternating with an equal number of regions having corrugations of small amplitude, and said regions having corrugations of small amplitude and corrugations of large amplitude have the same lengths measured in a direction parallel to the crests of the corrugations and said fill sheets further characterized in that the corrugations of large amplitude have a curvilinear profile and the corrugations of small amplitude have an angular profile.



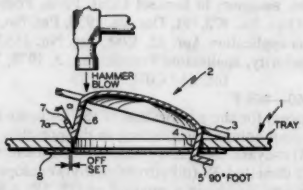
12. A furnishing device for an installation for putting a liquid contact with a gas, characterized in that it comprises a series of sheets according to the claim 1, wherein said sheets are juxtaposed and fixed to each other, the corrugations of large amplitude and small amplitude of each sheet having the same pitch and being in phase.

4,344,900

FRACTIONATOR TRAY VALVE

Ray L. Sonnedecker, Kansas City, Kans., and Ronald P. Martin, Toledo, Ohio, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 16, 1980, Ser. No. 197,454
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—114 VT **2 Claims**



1. A fractionator plate comprising a plurality of openings and a valve adapted to be positioned into and movably retained in one of said openings in said fractionator plate, said valve comprising (a) a cap larger than said opening and (b) at least three legs extending from said cap; wherein said valve is a unitary piece of material; wherein said at least three legs are movably retained in said opening; wherein said cap is movably retained above said plate; wherein a first leg of said at least three legs has a foot that extends outwardly at about 90° from said first leg; wherein a second leg of said at least three legs has a foot that extends outwardly at about 90° from said second leg; wherein a third leg of said at least three legs has an outwardly and upwardly oriented foot that presents a wedged contour such that said outwardly and upwardly oriented foot and said third leg form an acute angle; wherein said feet peripherally define an area greater than that of said opening; wherein said third leg is sufficiently flexible to be deformed to permit said feet to present a momentarily reduced peripherally defined area when said valve is pressed downwardly against said plate thus to permit the legs of said valve to be snapped into said opening; and wherein said outwardly and upwardly oriented foot presenting said wedged contour is adapted to at least fit partly into said opening when said first leg and said

second leg are within said opening and to present a wedged face to the edge of said opening whereby upon application of downwardly directed pressure on said valve said outwardly and upwardly oriented foot will be deformed inwardly from the edge of said opening until said valve has been mounted in said opening by the passing of said outwardly and upwardly oriented foot through said opening to allow said outwardly and upwardly oriented foot to regain its original position.

4,344,901

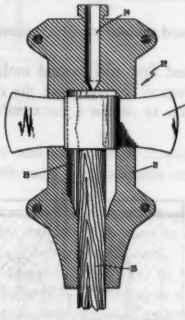
METHOD OF MAKING TOOL HANDLE

Bob N. Keathley, Bernie, Mo., assignor to IXL Manufacturing Co., Inc., Bernie, Mo.

Division of Ser. No. 67,260, Aug. 17, 1979, Pat. No. 4,287,640. This application Jun. 30, 1981, Ser. No. 278,939

Int. Cl.³ B29C *6/04*

U.S. Cl. 264—23 **15 Claims**



1. A method of producing an elongated tool handle, said method comprising:

(a) forming an elongated blank of kiln dried wood,

(b) reducing the moisture level of said kiln dried wood along a delimited length of said elongated blank,

(c) placing said moisture reduced delimited length into a mold cavity, and

(d) injecting a molten, high impact material into said mold cavity to secure said material directly to said wood in the delimited length of said blank,

(e) said molten material having a volumetric mass which gives off an amount of heat in its molten condition effective to drive moisture out of kiln dried wood.

4,344,902

PROCESS FOR MANUFACTURING FLEXIBLE DENSIFIED POLYMETHANE FOAM

Alan H. Milford, Hamden, and Oliver J. Proulx, Wallingford, both of Conn., assignors to Olin Corporation, New Haven, Conn.

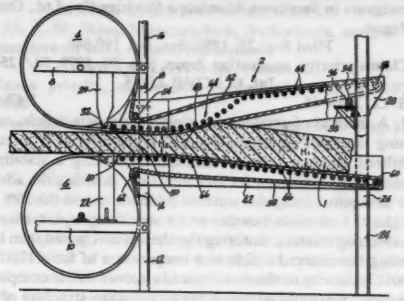
Division of Ser. No. 932,246, Aug. 9, 1978, Pat. No. 4,252,517, which is a continuation-in-part of Ser. No. 738,262, Nov. 2, 1976, Pat. No. 4,134,945. This application Nov. 1, 1979, Ser. No. 90,201

The portion of the term of this patent subsequent to Jan. 16, 1996, has been disclaimed.

Int. Cl.³ B29D *27/04*

U.S. Cl. 264—51 **8 Claims**

1. In a process for making flexible densified polyurethane foam wherein a polyurethane foam-forming reaction mixture is allowed to rise and is crushed before being cured, the improvement comprising conveying said partially cured freely risen foam to a crush conveyor and crushing said foam as said foam is being conveyed between upper and lower crushing portions of said crush conveyor, said upper crushing portion being of arcuate configuration having a radius of a dimension such that the ratio of the arc radius to the height of the freely risen foam is greater than 1.1 to 1, and the lower crushing portion being



oppositely disposed from said upper portion and comprising a planar section.

4,344,903

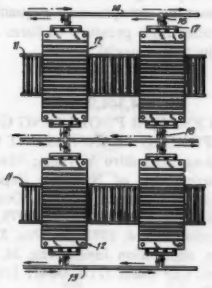
METHOD OF MAKING A CELLULAR POLYMERIC RESIN BODY IN A SELF CONTAINED HIGH-PRESSURE MOLD FORM

Maurice Y. Pascouet, 67-66 108th St., Forest Hills, N.Y. 11375

Continuation of Ser. No. 929,790, Jul. 31, 1978, abandoned. This application Jan. 23, 1981, Ser. No. 227,615

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—55 **11 Claims**



1. The method of producing a cellular synthetic organic polymeric body comprising the steps of depositing into an open high pressure receptacle a foamable polyvinyl chloride plastisol synthetic organic thermoplastic resin composition having dispersed therein in a finely divided state a thermal first gas blowing agent and an isocyanate which functions as a water activatable gas generating composition second blowing agent reactant, closing said receptacle to form a closed, fluid tight self contained mold form resistant to a predetermined internal pressure of at least a few thousand pounds per square inch, in the absence of any external press device, heating said self contained closed mold form from an external source of heat to raise the temperature of the contained composition to the gelation temperature of said resin and the heat activation temperature of said first blowing agent to gel, fuse and expand the foamable polyvinyl chloride plastisol resin composition and thereby produce a high internal pressure in said mold form not exceeding said predetermined internal pressure, cooling said form and the contents thereof, opening said form and removing the resulting embryo cellular thermoplastic body and thereafter exposing said embryo body to and maintaining contact with water to activate said second blowing agent gas generating composition.

4,344,904

SINTERING METHOD OF ZIRCONIA

Koichi Yamada, and Yasuo Shinya, both of Niihama, Japan, assignors to Sumitomo Aluminium Smelting Co., Ltd., Osaka, Japan

Filed Sep. 25, 1980, Ser. No. 190,845
Claims priority, application Japan, Sep. 28, 1979, 54/125589
Int. Cl.³ C04B *35/48*
U.S. Cl. 264—66 7 Claims

1. A method of producing a sintered zirconia article, comprising the steps of mixing 10–50% by weight of a partially stabilized zirconia powder obtained by adding a stabilizing agent to a zirconia powder and admixing, sintering the admixture and pulverizing the sintered admixture, and 90–50% by weight of a zirconia powder and a stabilizing agent; shaping the resulting mixture, sintering the shaped article and then heat treating the sintered article at a temperature of from 1200° to 1500° C., thereby to obtain a sintered zirconia article composed of a cubic phase crystal which has a crystalline structure of not more than 70% by weight and which is made up of 5–40% by weight of particles having a diameter range of 1–30μ and 95–60% by weight of particles having a diameter range of 30–300μ.

4,344,905

GAS LASERS

Arthur L. Chilcot, Aberlady, Scotland, assignor to Ferranti Limited, Hollinwood, England

Division of Ser. No. 840,252, Oct. 7, 1977, abandoned. This application Nov. 2, 1979, Ser. No. 90,510
Int. Cl.³ B22F *3/02*
U.S. Cl. 264—111 4 Claims

1. A method comprising forming a cathode electrode for a gas discharge laser by compressing a quantity of platinum black powder under high pressure to form a solid pellet of electrically conducting material.

4,344,906

PROCESS FOR PRODUCING GLASS FIBER-REINFORCED TRANSPARENT CAST SHEET

Yoshihiko Kitagawa; Masahiro Yuyama; Masahiko Moritani, and Mikio Suzuki, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 69,087, Aug. 23, 1979, abandoned. This application Jan. 6, 1981, Ser. No. 222,919
Claims priority, application Japan, Aug. 24, 1978, 53-103546
Int. Cl.³ C08K *7/14*; D04H *1/64*
U.S. Cl. 264—128 12 Claims

1. A process for producing a glass fiber-reinforced, transparent cast sheet, which comprises impregnating glass fibers with a resin syrup comprising

10 to 50 parts by weight of a copolymer (A) consisting essentially of 20 to 95% by weight of an aromatic vinyl compound and 5 to 80% weight of other polymerization monomer,

1 to 40 parts by weight of an aromatic vinyl compound (B),

50 to 90 parts by weight of other polymerizable monomer (C), and

0.5 to 10 parts by weight of maleic anhydride, and casting the resulting mixture.

4,344,907

METHOD AND APPARATUS PROVIDING UNIFORM RESIN DISTRIBUTION IN A COEXTRUDED PRODUCT

Fox J. Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 30, 1980, Ser. No. 201,688
Int. Cl.³ B29F *3/06*
U.S. Cl. 264—173 10 Claims

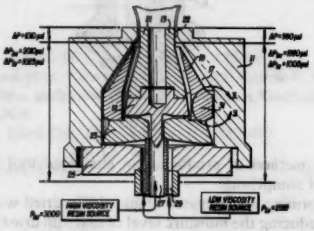
1. A method of coextruding a first molten resin stream of relatively high viscosity or flow rate and a second molten resin stream of relatively low viscosity or flow rate through a tubular die orifice in uniform laminar flow comprising the steps of:

flowing said first stream under pressure from a first molten resin supply through a first die channel to a flow junction region adjacent said die orifice;

flowing said second stream under pressure from a second resin supply through a second die channel to said flow junction region, said second die channel containing a flow restriction for impeding the flow of said second stream and raising the pressure drop of said second molten resin at said junction region to a value considerably larger than the maximum difference in pressure drop of said second molten resin existing at said junction region along the terminus of said second channel in the absence of said flow restriction, said restriction also being sufficient to decrease the pressure differential that would exist from one side of the die to the other in the absence of said flow restriction said decrease being of a magnitude sufficient to prevent non-uniform coextrusion of said first and second resin streams;

joining said first and second molten streams at said junction region;

flowing said joined first and second molten streams from said junction region through said die orifice in laminar flow relationship to obtain a coextruded resin material



having a uniform distribution of first and second resins therein.

5. An apparatus for coextruding a first molten resin stream of relatively high viscosity or flow rate and a second molten resin stream of relatively low viscosity or flow rate comprising:

a source of said first molten resin;

a source of said second molten resin;

a tubular coextrusion die comprising an extrusion orifice for producing a coextruded resin material, a first resin flow channel coupled to said first molten resin source and terminating at a flow junction region adjacent said orifice, a second resin flow channel coupled to said second molten resin source and terminating at said flow junction region, said second flow channel containing a flow restriction therein for impeding the flow of said second molten resin therethrough and raising the pressure drop therein to a value considerably larger than the maximum difference in pressure drop of said second molten resin existing at said junction region along the terminus of said second channel in the absence of said flow restriction, said flow restriction also decreasing the pressure differential that would exist from one side of the die to the other in the absence of said flow restriction said decreasing being of a magnitude sufficient to prevent non-uniform coextruding of said first and second resin streams and, a flow channel coupling said junction region to said orifice.

4,344,908

PROCESS FOR MAKING POLYMER FILAMENTS WHICH HAVE A HIGH TENSILE STRENGTH AND A HIGH MODULUS

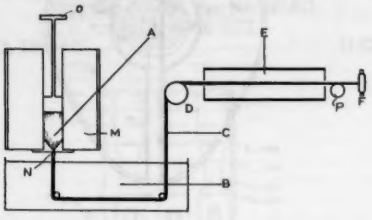
Paul Smith, Sittard, and Pieter J. Lemstra, Brunssum, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Feb. 6, 1980, Ser. No. 119,045

Claims priority, application Netherlands, Feb. 8, 1979, 7900990

Int. Cl.³ D01F 6/00

U.S. Cl. 264—203 8 Claims



1. A process for making polymer filaments which have a high tensile strength and a high modulus comprising the steps of,

(a) spinning a solution of a polymer, ranging from about 1% to about 5% by weight of polymer to solvent, through a spinning aperture to form a filament,

(b) cooling said filament of step (a) to below the solution temperature of the polymer either in a zone containing a gas without promoting the evaporation of the solvent or with a cooling liquid that does not dilute or extract the solvent in the filament,

(c) bringing said filament to a temperature between the swelling point of the polymer in the solvent and the melting point of the polymer and,

(d) stretching the filament that still contains at least about 25% by weight of solvent relative to the polymer, at a stretching ratio of at least 5.

4,344,909

THERMOCHROMIC COMPOSITION

Francis J. A. M. C. De Blauwe, Lubbeek, Belgium, assignor to N.V. Raychem S.A., Kessle-lo, Belgium

Filed Dec. 20, 1979, Ser. No. 105,587

Claims priority, application United Kingdom, Dec. 22, 1978, 49880/78

Int. Cl.³ C09K 3/00; C10K 11/12; C09D 5/08, 5/26

U.S. Cl. 264—230 21 Claims

1. A heat-recoverable article which is to be heated to a pre-selected temperature during installation or use, which is capable of forming an enclosure about a body, which carries on a surface which will face the interior of the enclosure a meltable composition, and which carries a temperature indicating composition on a surface which will be visible when the article is enclosing the body, the temperature indicating composition comprising decomposable organic material which, on heating of the article to the pre-selected temperature, melts and decomposes substantially irreversibly to provide a visible color change, said pre-selected temperature being a temperature which results in the melting of said meltable composition to effect sealing of the enclosure.

4,344,910

PROCESS FOR THE MANUFACTURE OF WATER-HARDENING MATERIAL

Jan M. J. M. Bijen, Munstergeleen, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed Apr. 2, 1979, Ser. No. 26,221

Claims priority, application Netherlands, Apr. 1, 1978, 7803508

The portion of the term of this patent subsequent to May 12, 1998, has been disclaimed.

Int. Cl.³ B29H 9/02

U.S. Cl. 264—257 21 Claims

1. An improved process for the manufacture of reinforced shaped articles from water-hardening materials, said improvement comprising incorporating in said water-hardening materials a plurality of continuous networks of synthetic organic polymer material having at least two meshes per square centimeter, said networks having been prepared by forming said meshes in an unfibrillated film of said synthetic organic polymer material in a manner so as to avoid forming meshes having sharp corners.

4,344,911

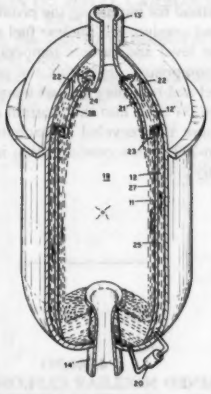
FLUIDIZED WALL FOR PROTECTING FUSION CHAMBER WALLS

James A. Maniscalco, Danville, and Wayne R. Meier, Livermore, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 851,331, Nov. 14, 1977, abandoned. This application Oct. 25, 1979, Ser. No. 88,222

Int. Cl.³ G21B 1/00

U.S. Cl. 376—102 9 Claims



1. A method for protecting the inner wall of an inertial confinement fusion chamber from damage by X-rays, neutrons, and debris generated by the implosion of fusion fuel targets in the chamber, comprising the steps of: forming the inner wall of the chamber so as to include an upright cylindrical section, forming an annulus about the exterior of substantially the entire upright cylindrical section of the inner wall, forming at least one annular opening adjacent an upper portion of the upright cylindrical section of the inner wall and in open communication with the annulus, forming a flowing wall of selected material in liquid form which flows along an inner wall surface of substantially the entire upright cylindrical section of the fusion chamber by directing the material through the annulus and through the at least one annular opening in the inner wall, recirculating at least a portion of the material from a lower portion of the fusion chamber upwardly through the annulus and inwardly through the at least one annular opening

so as to produce a waterfall effect forming the flowing wall and to maintain a continuous flowing wall which substantially prevents generated X-rays, neutrons and debris from contacting the wall surface of the fusion chamber, forming a second annulus about the exterior of an upper section of the fusion chamber above the upright cylindrical section thereof and in open communication with the first-mentioned annulus, providing at least one annular opening adjacent an upper end of the fusion chamber between the second annulus and the interior of the fusion chamber, and forming a thin sheet of the selected material which flows from the upper end of said fusion chamber downwardly along the inner wall surface of the upper section of the fusion chamber above the upright cylindrical section thereof and mixes with the flowing wall by directing the material upwardly through the second annulus and inwardly through the at least one annular opening located adjacent the upper end of the fusion chamber.

4,344,912

METHOD OF INCREASING THE DETERRENT TO PROLIFERATION OF NUCLEAR FUELS

Donald S. Rampolla, Pittsburgh, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 16, 1980, Ser. No. 159,891

Int. Cl.³ G21G *1/00*; G21C *3/02*

U.S. Cl. 376—180 **4 Claims**

1. In a method for increasing the proliferation deterrence of a thorium and uranium-233 nuclear fuel mixture by increasing the radiation level and surface temperature thereof, the improvement comprising: separating the protactinium-231 from the spent fuel and recycling at least a portion of the separated protactinium-231 back into the thorium and uranium-233 fuel mixture, where the recycled protactinium-231 is converted into uranium-232 with a concentration in the fuel mixture of approximately 1.2%.

4,344,913

CONTAINED NUCLEAR EXPLOSION BREEDER REACTOR SYSTEM

Edward F. Marwick, 5149 W. Morse Ave., Skokie, Ill. 60076

Continuation-in-part of Ser. No. 953,166, Oct. 20, 1978, which is a continuation-in-part of Ser. No. 810,894, Jun. 28, 1977, Pat. No. 4,121,971, which is a continuation-in-part of Ser. No. 544,178, Jan. 27, 1975. This application May 21, 1979, Ser. No. 40,849

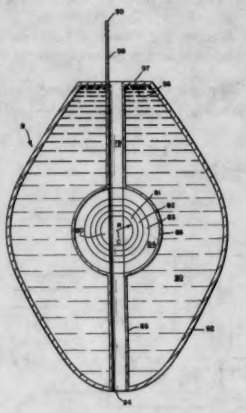
Int. Cl.³ G21C *9/00*

U.S. Cl. 376—317 **46 Claims**

1. A method of producing energy and isotopes within a containing chamber, said method comprising the steps of:

introducing a large, sub-critical mass having an opening therethrough into the containing chamber, said mass having an enclosed neutron reflecting slurry means surrounding a layered centroid portion;

propelling first and second sub-critical slugs into said chamber from generally opposite directions for intercepting said mass to cause a reaction for the production of thermal energy and neutrons; and



introducing material into the chamber to absorb said thermal energy and isotopes and protect said chamber from damage.

4,344,914

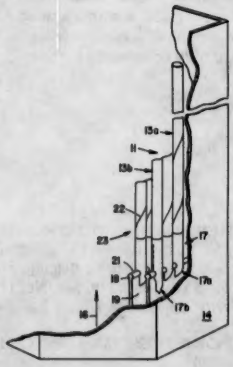
RETRIEVABLE FUEL PIN END MEMBER FOR A NUCLEAR REACTOR

Jerry M. Rosa, Los Gatos, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 6, 1980, Ser. No. 175,814

Int. Cl.³ G21C *3/32*

U.S. Cl. 376—437 **12 Claims**



1. A retrievable and reinsertable nuclear reactor fuel pin having an end member for fastening said fuel pin to a transversely extending rail wherein said end member has a pair of blades having outer ends and facing surfaces defining a longitudinally extending slot therebetween for receiving said rail, said end member being formed at least in part of resilient material and having a configuration which requires wedging apart of said blades by said rail when said fuel pin is pulled away from said rail, the facing surfaces of said blades which define a first region of said slot are spaced apart a distance smaller than the spacing of the facing surfaces of said blades which define a second region of said slot, said first region of said slot being located closer to the outer ends of said blades than said second

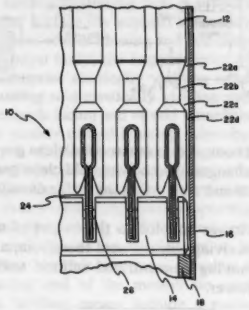
region of said slot, said facing surfaces of said blades defining a third region of said slot, said third region of said slot having a spacing of substantially constant distance between said facing surfaces and greater than the distance between said facing surfaces of said first region and being located closer to the outer ends of said blades than said first region.

4,344,915

NUCLEAR REACTOR FUEL ROD ATTACHMENT SYSTEM

David W. Christiansen, Kennewick, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 17, 1980, Ser. No. 187,913
Int. Cl.³ G21C *3/32*
U.S. Cl. 376—437 **11 Claims**



1. A system for removably attaching a nuclear reactor fuel rod to a support member comprising:

a. A reusable locking cap, secured to said nuclear reactor fuel rod, having opposing, resiliently deflectable fingers defining a socket having a body, throat, and mouth portion, said socket also having a narrowing decoupling-aiding tapered section from said body portion to said throat portion and a narrowing coupling-aiding tapered section from said mouth portion to said throat portion; and

b. A reusable locking strip, secured to said support member, having an extension which fixedly engages said body portion of said socket, said extension comprising a top section which, upon application of a coupling force, engages said coupling-aiding tapered section to deflect open said fingers to widen said throat portion for receiving said extension into said body portion of said socket, and said extension also comprising a bottom section which, upon application of a decoupling force, engages said decoupling-aiding tapered section to deflect open said fingers without distortion to widen said throat portion for removing said extension from said body portion of said socket.

4,344,916

METHOD FOR SHIPPING AND STORING ETHYLENE OXIDE

Nicholas B. Lorette, Lake Jackson, Tex., and Jerry L. Fosnaugh, Carmel, Ind., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 141,236, Apr. 17, 1980, abandoned. This application Mar. 5, 1981, Ser. No. 240,746
Int. Cl.³ B01J *19/00*; A01N *31/00*; C07D *301/36, 303/00*
U.S. Cl. 422—40 **4 Claims**

1. A method for transporting liquid ethylene oxide from a place of origin to a remote destination which comprises (1) mixing said ethylene oxide with at least 52% by weight of liquid propylene oxide based on the weight of the total mixture, (2) loading said liquid mixture into a container suitable for transport and (3) transporting said container by suitable means to said remote destination.

4,344,917

SAMPLE INLET FOR ANALYSIS INSTRUMENT AND METHOD OF SAMPLE ANALYSIS

Karl S. Schorno, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 19, 1980, Ser. No. 218,337
Int. Cl.³ G01N *1/22*
U.S. Cl. 422—78 **23 Claims**

1. An injection system adapter for an analytical instrument for analyzing vapors thermally extracted from a sample selected from solids and liquids, the analytical instrument including at least one detecting means and an internal heat source, the injection system adapter comprising

a first section comprising a sample chamber, means for heating the sample chamber, a carrier gas inlet to the sample chamber, a sample inlet at one end of the sample chamber and an opposing outlet; and

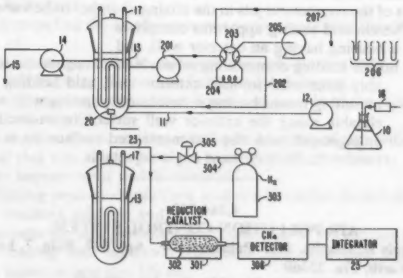
a second ajoining section comprising means for defining a flow path extending from said outlet and for absorbing heat from the internal heat source of the analytical instrument, thereby preventing vapor condensation in said flow path.

4,344,918

DETERMINATION OF TOTAL CARBON IN LIQUID SAMPLES

Yoshihiro Takahashi, San Jose, Calif., assignor to Xertex Corporation, Menlo Park, Calif.

Filed Mar. 5, 1980, Ser. No. 127,333
Int. Cl.³ G01N *31/12, 21/63*
U.S. Cl. 422—80 **5 Claims**



1. Apparatus for determining total carbon in a liquid sample comprising: a reactor, a flowline leading into said reactor, means defining a source of a liquid containing an oxidizing agent connected to and communicating with said flowline, means for maintaining a continuous flow of said liquid containing said oxidizing agent into said reactor via said flowline, means for introducing a liquid sample into said reactor, a source of electromagnetic radiation positioned inside said reactor so as to be immersed in said liquid containing said oxidizing agent, said electromagnetic radiation causing oxidation of carbonaceous matter in each sample, means for causing gas produced by oxidation of said carbonaceous matter in each sample to be removed from said reactor, means operatively

connected to said last-mentioned removal means for measuring total carbon in said gas, said means for introducing said liquid sample into said reactor comprising means for continuously withdrawing liquid from said reactor, means for introducing a selected quantity of the liquid sample into the liquid removed from the reactor, and means separate from said flowline for continuously recirculating said liquid continuously removed from the reactor together with any selected quantity of sample liquid therein back to the reactor.

4,344,919

PROCESS AND APPARATUS FOR THE COUNTER-CURRENT INJECTION-MIXING OF TWO OR MORE FLUID PLASTIC COMPONENTS WHICH REACT WITH ONE ANOTHER

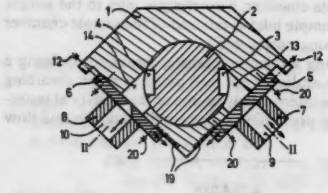
Manfred Kelterbaum, Strasslach, Fed. Rep. of Germany, assignor to Elastogran Maschinenbau GmbH & Co., Strasslach, Fed. Rep. of Germany

Filed Jun. 10, 1980, Ser. No. 158,069

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1979, 2925173; Jun. 22, 1979, 7917920[U]

Int. Cl.³ B01J *14/00*

U.S. Cl. 422—133 **6 Claims**



1. Apparatus for the counter-current injection mixing of two or more fluid plastic components which react with one another, comprising a mixing chamber which possesses inlet orifices for the individual components and an outlet for the component mixture, injection nozzles so arranged in the orifices relative to the mixing chamber that the jets impinge on one another at an angle in the mixing chamber, the injection nozzles being adjustable so as to allow the point of impingement of the component jets in the mixing chamber to be varied, wherein said mixing apparatus comprises

a housing having an exterior wall, and

nozzle holding or mounting means located on, and detachably connected to, said exterior wall, said holding or mounting means having a surface cooperating with and slidable along the exterior wall surface in contacting engagement with the last-mentioned surface so as to render the impingement angle adjustable.

4,344,920

AIR POLLUTION CONTROL SYSTEM

Morris D. Isserlis, 3655 Poinciana Dr., Apt. 507, Bldg. 7, Lake Worth, Fla. 33460

Filed Jul. 21, 1981, Ser. No. 285,852

Int. Cl.³ B01D *50/00*

U.S. Cl. 422—169 **2 Claims**

1. A coal burning system including means for cleaning the gases of combustion and removing sulfuric acid therefrom, comprising

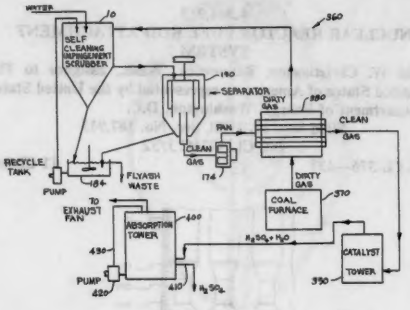
first means for burning coal and producing hot, dirty gas therefrom, the gas containing sulfur dioxide,

a heat exchanger having a first input coupled to the output flue of said first means and receiving hot, dirty gas therefrom,

second means for removing particulate matter from said gas but not removing the sulfur dioxide,

a first output from said heat exchanger for the dirty gas containing sulfur dioxide, said output being coupled to said second means which removes particulate matter from the gas to produce clean gas containing sulfur dioxide,

third means coupled between the output of said second means and a second input of said heat exchanger for directing clean gas containing sulfur dioxide thereto, said clean gas being heated in said heat exchanger and fed to a second output therefrom,



a catalyst tower coupled to said second clean gas outlet from said heat exchanger for receiving said clean gas containing sulfur dioxide and converting the sulfur dioxide to sulfuric acid.

an absorption tower coupled to the output of said catalyst tower for receiving sulfuric acid therefrom, and

means for removing concentrated sulfuric acid from said absorption tower.

4,344,921

CATALYZER FOR DETOXIFYING EXHAUST GASES FROM INTERNAL COMBUSTION ENGINES

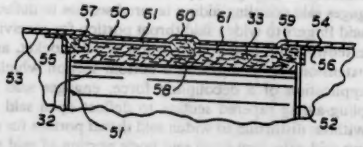
Andres Santiago, and Enrique Santiago, both of Augsburg, Fed. Rep. of Germany, assignors to Zeuna-Staerker KG, Augsburg, Fed. Rep. of Germany

Division of Ser. No. 342,540, Mar. 19, 1973. This application Sep. 6, 1977, Ser. No. 831,044

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1972, 2213539

Int. Cl.³ B01J *35/04, 8/02*; F01N *3/15*

U.S. Cl. 422—179 **3 Claims**



1. In a catalyzer for detoxifying exhaust gases from internal combustion engines, wherein a monolithic catalyst body having an outer surface and facing ends is supported in a housing having an inner surface, by support means arranged between said inner surface of said housing and said outer surface of said monolithic catalyst body, the improvement wherein said support means comprise elastically yielding means, and holding means for locating said elastically yielding means at least partially between each facing end of said monolithic catalyst body and the inner surface of said housing, whereby the monolithic catalyst body is elastically restrained in said housing against movement in all three dimensions of space, wherein said elastically yielding means are elastically deformable damping rings, said holding means comprising inner supporting means located in said housing for holding said rings whereby the damping

rings are securely seated on the respective inner supporting means and thus between the inner housing surface and the respective facing end of the monolithic catalyst body; and wherein said holding means include recesses provided in the periphery of said monolithic catalyst body adjacent each facing end thereof for compressing the elastically deformable damping rings between the inner wall of said housing and the respective facing end of said monolithic catalyst body in a gas tight manner thereby supporting said damping rings at an inner diameter thereof which rests in said recesses; said elastically deformable rings comprising at least two such rings seated in said recesses, one of the two such rings overlapping the upstream end of said monolithic catalyst body and the other such ring overlapping the downstream end of said monolithic catalyst body such that the monolithic catalyst body is held against both axial and radial movement.

2. In a catalyzer for detoxifying exhaust gases from internal combustion engines, wherein a monolithic catalyst body having an outer surface and facing ends is supported in a housing having an inner surface, by support means arranged between said inner surfaces of said housing and said outer surface of said monolithic catalyst body, the improvement wherein said support means comprise elastically yielding means, and holding means for locating said elastically yielding means at least partially between each facing end of said monolithic catalyst body and the inner surface of said housing, whereby the monolithic catalyst body is elastically restrained in said housing against movement in all three dimensions of space, wherein said elastically yielding means are elastically deformable damping rings, said holding means comprising inner supporting means located in said housing for holding said rings whereby the damping rings are securely seated on the respective inner supporting means and thus between the inner housing surface and the respective facing end of the monolithic catalyst body; and wherein said holding means include a protective envelope arranged around said catalyst body and provided with recesses at the upstream and downstream ends thereof for compressing the elastically deformable damping rings between the inner walls of said housing and the respective facing end of said monolithic catalyst body in a gas tight manner thereby supporting said damping rings at an inner diameter thereof which rests in said recesses; said elastically deformable rings comprising at least two such rings seated in said recesses, one of the two rings overlapping the upstream end of said protective envelope and the other such ring overlapping the downstream end of said protective envelope such that the monolithic catalyst body is held against both axial and radial movement.

4,344,922
CATALYZER FOR DETOXIFYING EXHAUST GASES FROM INTERNAL COMBUSTION

Andres Santiago, and Enrique Santiago, both of Augsburg, Fed. Rep. of Germany, assignors to Zeuna-Staerker KG, Augsburg, Fed. Rep. of Germany

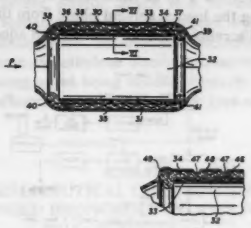
Division of Ser. No. 342,540, Mar. 19, 1973. This application Sep. 6, 1977, Ser. No. 831,045

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1972, 2213539; Apr. 28, 1972, 2220921; May 9, 1972, 2222663; Jan. 26, 1973, 2302789

Int. Cl.³ F01N *3/15*; B01J *8/06*

U.S. Cl. 422—179 **2 Claims**

1. In a catalyzer for detoxifying exhaust gases from internal combustion engines, wherein a monolithic catalyst body having an outer surface and facing ends is supported in a housing having an inner surface, by support means arranged between said inner surface of said housing and said outer surface of said monolithic catalyst body, the improvement wherein said support means comprises a layer of elastically yielding means, said layer extending at least partially between each facing end of said monolithic catalyst body and said housing, whereby the monolithic catalyst body is elastically restrained in said housing against movement in all three dimensions of space, said layer of elastically yielding means extending radially inwardly across said facing ends and then folding radially outwardly towards said inner surface, to form bends which bends are compressed between said facing ends and said housing, the bends in said layer forming elastically deformable damping



means to restrain said catalyst body and form a substantially gas tight barrier, thereby substantially preventing the flow of gas into the space between the catalyst body and the inner surface of the housing.

4,344,923
IN-SITU LEACHING

Brian Martin, Bedford, England, assignor to Interox Chemicals Limited, London, England

Filed Oct. 2, 1979, Ser. No. 81,133

Claims priority, application United Kingdom, Oct. 21, 1978, 41493/78

Int. Cl.³ C01G *43/00*; E21C *41/14*

U.S. Cl. 423—20 **7 Claims**

1. In a process of in-situ leaching of a uranium ore in the ground, which comprises the steps of:

(a) drilling at least one injection well and at least one production well offset from the injection well into an ore body located underground containing uranium and at least one transition metal;

(b) injecting an acid leaching solution containing sulphuric acid and an oxidant into the uranium-containing ore body through the injection wells;

(c) recovering from the production wells a leach liquor containing dissolved uranium salts formed by passage of the leaching solution through the uranium-containing ore body; and

(d) recycling the leach liquor in a cycle comprising the steps of:

(i) passage of the leach liquor through the ore body

(ii) recovery of uranium from the leach liquor;

(iii) make up of the leach liquor and recycle of the liquor to step (i),

said uranium ore containing significant amounts of a transition metal that acts as a catalyst for peroxidant decomposition;

the improvement which comprises:

utilizing peroxomonosulfuric acid as said oxidant in said acid leaching solution; and

introducing said peroxomonosulfuric acid to the process by feeding said peroxomonosulfuric acid with said leach liquor in said step (d) iii.

4,344,924
SOLVENT EXTRACTION OF CHROMIUM AND VANADIUM

Bernard H. Lucas, and Gordon M. Ritcey, both of Ottawa, Canada, assignors to Canadian Patents & Development Ltd., Ottawa, Canada

Filed Aug. 11, 1980, Ser. No. 177,103

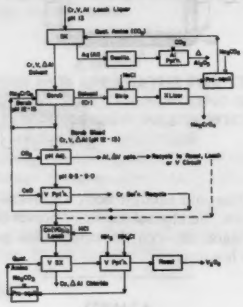
Claims priority, application Canada, Sep. 28, 1979, 337874

Int. Cl.³ C01G *37/00*, *31/00*

U.S. Cl. 423—54 **14 Claims**

1. A process for solvent extraction and recovery of chromium and vanadium from aqueous alkaline solutions, waste liquors or leach liquors containing said metals, comprising:

(a) contacting the aqueous solution or liquor, at a pH of about 13 to 13.5, with an immiscible quaternary amine solvent phase, sufficient amine being utilized to cause both Cr and all of the V to be transferred to the solvent phase;
(b) separating the loaded solvent phase from the solution or liquor and scrubbing the solvent with an aqueous chromi-



um-containing solution to remove substantially all metals except Cr from the solvent;
(c) recovering Cr from the scrubbed amine solvent phase by stripping with an aqueous solution and recovering Cr from the aqueous strip liquor; and
(d) recovering V from the scrub liquor by selective precipitation and further purification.

4,344,925

OZONE WHITENING OF SYNTHETIC GYPSUM

Philippe Pichat, Paris, and Robert Sinn, Lens, Michel Neil Annezin, all of France, assignors to Societe Chimique des Charbonnages, Paris, France

Continuation-in-part of Ser. No. 112,023, Jan. 14, 1980, abandoned. This application Jan. 15, 1981, Ser. No. 225,232
Claims priority, application France, Jan. 12, 1979, 79 00772
Int. Cl.³ C04B *11/00, 11/02;* C01F *11/46*
U.S. Cl. 423—170 9 Claims

1. A process for whitening a phosphogypsum an aqueous suspension of which has a pH higher than 3, comprising acidifying an aqueous suspension of the phosphogypsum to be bleached to pH 3 or lower, and treating the suspension having a pH of 3 or lower with an amount of ozone equal to at least 150 parts by weight per million parts by weight of phosphogypsum calculated as $CaSO_4.2H_2O$; thereby producing a whiteness grade of phosphogypsum higher than 75, according to French Standard NF 03-038.

4,344,926

FLUID CATALYTIC CRACKING

Randall H. Petty, Nederland, and Burton H. Bartley, Port Arthur, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 22, 1980, Ser. No. 180,357
Int. Cl.³ B01D *53/34*
U.S. Cl. 423—244 3 Claims

1. A process for the removal of a gaseous sulfur compound from a mixture of gases comprising sulfur oxides and free oxygen which comprises contacting said mixture of gases at a temperature in the range of 800° to 1500° F. with a composite of alumina and oxides of bismuth wherein said composite comprises 0.1 to 4 weight percent bismuth.

4,344,927

METHOD OF PREPARING CRYSTALLINE SILICA POLYMORPH

Dean A. Young, 4721 Palm Ave., Yorba Linda, Calif. 92686

Continuation-in-part of Ser. No. 12,867, Feb. 16, 1979, abandoned. This application Dec. 17, 1980, Ser. No. 217,238
Int. Cl.³ C01B *33/12*
U.S. Cl. 423—339 7 Claims

1. A process for hydrothermally preparing a crystalline silica polymorph which comprises: (1) subjecting an aqueous reaction mixture to high shear mixing for 4 to 100 hours at a temperature of from 250° to 380° F., said reaction mixture containing from 2 to 6 weight percent of sodium oxide, from 8 to 16 weight percent of silicon oxide, from 0.01 to 0.25 weight percent of disodium 4-dodecylated oxydibenzene sulfonate, from 2 to 5 weight percent of anhydrous sulfuric acid, from 0.5 to 3 weight percent of sodium chloride and either from 6 to 13 weight percent of tetrapropyl ammonium bromide or a mixture which comprises from 2 to 4 weight percent of tripropylamine, from 1 to 3 weight percent of 1-bromopropane and from 3 to 6 weight percent of methylethyl ketone, and (2) crystallizing said silica polymorph during said high shear mixing, wherein said crystalline silica polymorph after calcination at 1,000° F. for 16 hours, has as the four strongest d-values of its X-ray diffraction pattern, d=11.05, d=9.96, d=3.82 and d=3.34.

4,344,928

PROCESS FOR PREPARING ALUMINA PARTICULATES, AT LEAST A FRACTION OF WHICH BEING ULTRAFINE BOEHMITE

Thierry Dupin, Garges les Gonesse; Gilbert Bouge, and Laurent Seigneurin, both of Salindres, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Feb. 26, 1980, Ser. No. 124,777
Claims priority, application France, Feb. 26, 1979, 79 04809
Int. Cl.³ C01F *7/02*
U.S. Cl. 423—626 32 Claims

1. A process for the preparation of an aqueous suspension of alumina particulates, at least a portion of which comprises ultrafine boehmite, which process comprises maintaining an aqueous formulation comprising water and an alumina powder having a specific surface between about 200 and 400 m^2/g, particle diameters between about 0.1 and 300 microns, ignition loss, measured by calcination at 1000° C., of between about 3 and 15%, and which is selected from the group consisting of poorly crystalline activated alumina, amorphous activated alumina, and admixtures thereof, said aqueous formulation having a pH of less than 9, at a temperature in the range of from about 120° to about 225° C. for a period of time sufficient to effect the transformation of at least 5% of such alumina powder into ultrafine boehmite.

4,344,929

METHOD OF DELIVERING DRUG WITH AID OF EFFERVESCENT ACTIVITY GENERATED IN ENVIRONMENT OF USE

Pieter Bonsen, Los Altos, Calif.; Patrick S. Wong, Kowloon, Hong Kong, and Felix Theeuwes, Los Altos, Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Division of Ser. No. 143,644, Apr. 25, 1980, Pat. No. 4,265,874. This application Jan. 26, 1981, Ser. No. 228,091
Int. Cl.³ A61K *9/46;* A61J *1/00*
U.S. Cl. 424—15 31 Claims

1. A method for delivering from an osmotic device a drug that is difficult to deliver to an environment of use having a pH of less tha seven, wherein the method comprises:
(1) admitting into the environment an osmotic drug delivery device, which device comprises:
(a) a shaped wall formed of a semipermeable material that is permeable to the passage of fluid present in the environment, and substantially impermeable to the passage

of drugs and compounds, which wall surrounds and forms;

(b) a compartment housing a drug that is difficult to deliver to the environment, and a basic compound having a gas generating moiety, which compound is soluble in fluid that enters the compartment;

(c) a passageway in the wall connecting the compartment and the exterior of the device for dispensing drug from the device; and,

(2) imbibing fluid through the wall into the compartment in a tendency towards osmotic equilibrium at a rate determined by the permeability of the wall and the osmotic pressure gradient across the wall; thereby

(3) forming a solution of the basic compound containing drug, which solution is dispensed from the compartment through the passageway into the environment with the compound reactively;

(4) generating a gas on its contact with the fluid of the environment producing an effervescent suspension that delivers the drug in a finely dispersed form to the environment over a prolonged period of time.

4,344,930

SKIN CARE SPONGE

David M. MacRae, Beecroft, Australia, and Karl H. Roberts, Flemington, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 627,421, Oct. 30, 1975, abandoned.
This application Sep. 15, 1980, Ser. No. 187,374
Int. Cl.³ A61K *9/70*; A61L *15/00*
U.S. Cl. 424—28 **10 Claims**

1. A method of preparing hydrophilic open-celled poly (urea/urethane) sponge comprising reacting (a) a prepolymer having an average NCO functionality greater than 2 and produced by reaction of a polyoxyethylene polyol with a stoichiometric excess of an organic polyisocyanate, with (b) about 30 to 200% of water by weight of said prepolymer, said water containing about 6 to 100%, by weight of said prepolymer, of a readily releasable skin care composition, said sponge thereby containing said skin care composition substantially uniformly distributed throughout the pores thereof.

4,344,931

DRY DENTIFRICE POWDERS

Abel Aguilar, Los Capulies No. 270, Lima, Peru (18)

Filed Apr. 13, 1981, Ser. No. 253,386
Claims priority, application Peru, Dec. 18, 1980, 40856
Int. Cl.³ A61K *7/16, 7/18*
U.S. Cl. 424—52 **16 Claims**

1. A method of instantly converting a dry powder dentifrice composition into a homogeneous dental cream comprising:

(a) combining with components common to conventional dry dentifrice compositions, from 2% to 10% by weight, based on the weight of the dry powder dentifrice composition, of at least one readily water-soluble dry powdered gum and an amount of a magnesium or calcium silicate effective as a polishing agent, and

(b) adding an amount of water sufficient to immediately convert the dry powder dentifrice composition into a homogeneous dental cream.

4,344,932

NAIL CLEANSER

Harry W. Gordon, New York, N.Y., assignor to Del Laboratories, Inc., Farmingdale, N.Y.

Filed Jun. 2, 1980, Ser. No. 155,607
Int. Cl.³ A61K *7/04*
U.S. Cl. 424—61 **7 Claims**

1. A nail cleanser for application to human nails to remove stains therefrom, said cleanser constituting a composition essentially comprising as necessary ingredients a first chelating agent, a second chelating agent and a liquid carrier which will solvate or disperse said first and said second chelating agents, said first chelating agent being more effective than said second chelating agent, the second chelating agent also being a solubilizing agent, said first chelating agent being selected from the group consisting of ethylene diamine tetraacetic acid and alkali metal salts thereof, phytol, phytic acid, nitrilo-triacetic acid, diethylene triamino pentacetic acid, sodium tripolyphosphates, sodium metaphosphate, sodium hexamethaphosphate, trisodium phosphate and ethylene diaminotetraacetic acid, and the second chelating agent being selected from the group consisting of urea, allantoin, penthenol and aloe vera extract and urea precursors.

4,344,933

PHARMACEUTICAL COMPOSITION WITH PROLONGED BRONCHOLYTIC AND TOCOLYTIC ACTIVITY

Annemarie Siegl, Linz; Christian Knopp, Graz, and Karl Reithmayr, Linz, all of Austria, assignors to Chemie Linz Aktiengesellschaft, Austria

Filed Jul. 14, 1980, Ser. No. 168,139
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1979, 2929456
Int. Cl.³ A61K *31/74, 31/135*
U.S. Cl. 424—79 **4 Claims**

1. A pharmaceutical complex with prolonged broncholytic and tocolytic activity consisting of a resinate prepared by reacting N,N'-bis-[2-(3',4'-dihydroxyphenyl)-2-hydroxyethyl]-hexamethylenediamine with a polystyrene resin which is crosslinked with divinylbenzene to a degree of 2–5% and contains sulfonic acid radicals as anchor groups.

3. A pharmaceutical composition for peroral administration having broncholytic and tocolytic activity comprising a broncholytically or tocolytically effective amount of the complex according to claim 1 and a pharmaceutically acceptable carrier.

4,344,934

THERAPEUTIC COMPOSITIONS WITH ENHANCED BIOAVAILABILITY

Frederick H. Martin, West Chazy, and Andrew G. Tsuk, Plattsburgh, both of N.Y., assignors to American Home Products Corporation, New York, N.Y.

Continuation of Ser. No. 962,435, Nov. 20, 1978, abandoned.
This application Feb. 21, 1980, Ser. No. 123,143
Int. Cl.³ A61K *31/79, 37/00, 31/74, 9/24, 31/245*
U.S. Cl. 424—80 **23 Claims**

1. A pharmaceutical composition in dry solid form comprising a mixture of a therapeutically effective amount of a poorly water soluble drug and a non-toxic, pharmacologically acceptable, water-soluble polymer; said mixture being the product of a melt mix or of a dried solution and said mixture in dry solid form having been treated with solution comprising water and a minor amount of a wetting agent selected from anionic and cationic surfactants and then dried.

4,344,935

PROCESS FOR THE ISOLATION OF VIRAL GLYCOPROTEIC ANTIGENS AND ITS APPLICATION TO THE PREPARATION OF VACCINES

Jean Leclerc, Libourne, and Jean de Rudder, Versailles, both of France, assignors to Synthelabo, Paris, France

Filed May 19, 1981, Ser. No. 265,084
Claims priority, application France, Jun. 5, 1980, 80 12522
Int. Cl.³ A61K *39/12, 39/145*
U.S. Cl. 424—89 **11 Claims**

1. Process for the isolation of the glycoproteic antigens of a virus by treatment of said virus with an aqeous solution of a nonionic detergent, separation of the viral particles and removal of the detergent, comprising, in order to remove the detergent, effecting a phase separation between an aqueous phase and a phase consisting of a water-insoluble alkanol hav-

ing at least 7 and less than 12 carbon atoms, and recovering the glycoproteic antigens in aqueous phase.

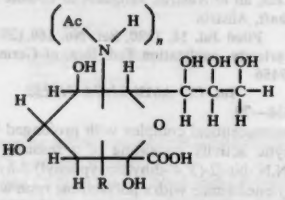
4,344,936

PLATELET COMPOSITION HAVING IMPROVED STORAGE STABILITY AND METHOD THEREFOR

Gerald Soslau, 509 Grandview Ave., Feasterville, Pa. 19047

Filed Sep. 17, 1980, Ser. No. 188,121
Int. Cl.[3] A61K *35/44*
U.S. Cl. 424—101 9 Claims

1. A composition for improving the storage stability of blood platelets comprising (a) said platelets, (b) a container for said platelets, and (c) an effective amount of a sialyl compound having the structural formula (I)



wherein Ac is an acetyl group, R is a carbohydrate group, n is an integer of 1 or more, and the R group replaces an hydroxyl group on the ring and the N-acetyl group replaces hydroxyl groups.

4,344,937

ANTIVIRAL AGENT COMPRISING 1-β-D-ARABINOFURANOSYLTHYMINE

Haruhiko Machida, Choshi, Japan, assignor to Yamasa Shoyu Kabushiki Kaisha, Choshi, Japan

Filed Aug. 28, 1980, Ser. No. 182,001
Claims priority, application Japan, Sep. 5, 1979, 54-112990
Int. Cl.[3] A61K *31/70*
U.S. Cl. 424—180 3 Claims

1. A method of treating DNA viral infections in humans or lower animals which comprises administering a pharmaceutically efficacious quantity of 1-β-D-arabinofuranosylthymine to a human or lower animal in need of such treatment through the alimentary canal thereof.

4,344,938

AGENT FOR THE TREATMENT OF ALLERGIC REACTIONS

Hans-Herald Sedlacek, and Friedrich R. Seiler, both of Marburg, Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Filed Oct. 23, 1979, Ser. No. 87,481
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1978, 2846412
Int. Cl.[3] A61K *37/00*; C07G *7/00*
U.S. Cl. 424—177 10 Claims

1. A pharmaceutical preparation for the prophylaxis or therapy of allergic reactions, said preparation comprising complex-fixed IgG immunoglobulin modified in the Fc-portion thereof by aggregation or immunological fixing to an antigen, or comprising immunologically active fragments of IgG immunoglobulin obtained by proteolytic fission of IgG immunoglobulin, said fragments being modified in the Fc-portion thereof, together with a pharmaceutically-acceptable carrier therefor.

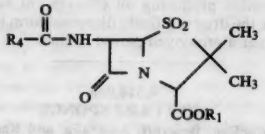
4,344,939

PENICILLIN 1,1-DIOXIDES, COMPOSITIONS THEREOF AND METHODS OF USE

Ekkehard Niemers; Hans-Bodo König; Wilfried Schröck, and Karl G. Metzger, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 29, 1980, Ser. No. 154,541
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1979, 2923339
The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.
Int. Cl.[3] A61K *31/425, 31/43, 31/44, 31/445, 31/505, 31/535, 31/655*; C07D *499/52, 499/54, 499/60, 499/76*
U.S. Cl. 424—226 8 Claims

1. A penicillin 1,1 dioxide of the formula



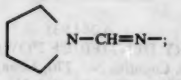
or a salt thereof, wherein

R_1 denotes a hydrogen atom or an ester-forming radical

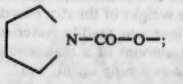
R_4 denotes hydrogen; a naphthyl which is optionally substituted by R_{16}

wherein

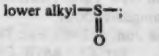
R_{16} denotes halogen; amino; mono-lower alkylamino; di-lower alkylamino; pyrrolidyl; piperidyl; HCO—NH—; lower alkyl—CO—NH—; H—CO—N (lower alkyl); di-lower alkylamino- lower alkyl; lower alkyl—CO—N(-lower alkyl)—; (lower alkyl) $_2$C=N—; lower alkyl—SO_2—NH—, lower alkyl—SO_2—N(lower alkyl)—; HO—SO_2—NH—; HO—SO_2—N(lower alkyl)—; amidino; (lower alkyl) $_2$—N—CH=N—;



guanido; nitro; azido; hydroxyl; lower alkoxy; H—CO—O—; lower alkyl—CO—O—; lower alkyl—O—CO—O—; H_2N—CO—O—; lower alkyl —NH—CO—O—; (lower alkyl)$_2$N—CO—O—;



H_2N—SO_2—O—; lower alkyl—NH—SO_2—O—; (lower alkyl)$_2$N—SO_2—O—; HOOC—; H_2N—CO—; (lower alkyl)$_2$N—CO—; OHC—; HO—SO_2—O—; HS—; lower alkyl—S—;



HO_3S—; lower alkyl—SO_2—; H_2N—SO_2—; lower alkyl—NH—SO_2—; (lower alkyl)$_2$N—SO_2—; or straight-chain or branched alkyl with 1 to 6 carbon atoms and phenyl or phenoxy;

or

wherein R_5 is H, aryl with 6–10 C-atoms, or heterocyclyl a hetero-paraffinic, hetero-aromatic or hetero-olefinic 5-membered to 7-membered ring with identical or different hetero-atoms selected from the group consisting of oxygen, sulphur and nitrogen and wherein

X is oxygen or R_{13}—N

R_{13} = hydroxy or alkoxy with 1–6 C-atoms optionally substituted by R_{16};

or

R_6 and R_7 independently being C_1–C_4 alkyl optionally substituted with R_{16} or C_1–C_4 alkoxy optionally substituted with R_{16}, or both together with the carbon atom to which they are bonded, denote dioxacyclopentane or dioxacyclohexane

R_8 being optionally substituted C_1–C_4 alkyl or C_1–C_4 alkoxy or a phenyl, furyl, thienyl, methylisoxazolyl or aminothiazolyl.

3. An antibacterial composition containing as an active ingredient an antibacterially effective amount of a compound or salt according to claim 1 in admixture with a diluent.

4,344,940

STEROID FORMULATION CONTAINING DIPOTASSIUM EDTA

Wing-Sun Chow, Upper Montclair, and Donald C. Monkhouse, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 30, 1981, Ser. No. 325,708

Int. Cl.³ A61K *31/58*

U.S. Cl. 424—241 **18 Claims**

12. The pharmaceutical composition as defined in claim 1 in the form of a lotion wherein said steroid is 21-chloro-9-fluoro-11β-hydroxy-16α,17-[(1-methylethylidene)bis(oxy)]pregn-4-ene-3,20-dione, and said polyol is 80 to 95% aqueous solution of polyethylene glycol having an average molecular weight of about 300.

18. A method of treating dermatitis, which comprises administering topically an effective amount of a composition as defined in claim 12.

4,344,941

ANTIANDROGENIC 17α-SUBSTITUTED STEROIDS

Rudolf Wiechert; Dieter Bittler; Annerose Schleusener, and Manfred Albring, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft (A.G.), Berlin and Bergkamen, Fed. Rep. of Germany

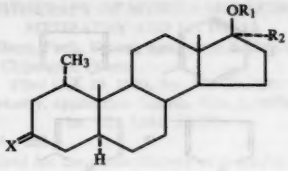
Filed Oct. 20, 1980, Ser. No. 198,383

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1979, 2943776

Int. Cl.³ A61K *31/56*; C07J *7/00*

U.S. Cl. 424—243 **11 Claims**

1. A 17α-substituted steroid of the formula



wherein

R_1 is hydrogen, an acyl group of a C_{1-17} optionally substituted, hydrocarbon carboxylic or sulfonic acid, C_{1-5} alkyl, C_{1-5}-alkenyl, C_{1-5}-alkyl or C_{1-5}-alkenyl interrupted by an oxa atom, cyclopentyl or tetrahydropyranyl,

R_2 is C_{2-6}-alkenyl,

X is oxygen or H(OR_3) wherein R_3 is hydrogen, an acyl group of a C_{1-17} optionally substituted, hydrocarbon carboxylic or sulfonic acid, C_{1-5} alkyl, C_{1-5}-alkenyl, C_{1-5}-alkyl or C_{1-5} alkenyl interrupted by an oxa atom, cyclopentyl or tetrahydropyranyl.

5. A method of achieving a topical antiandrogenic effect in a patient suffering from a disease treatable by topical administration of an antiandrogenically active agent, which comprises topically administering to the patient an antiandrogenically effective amount of a compound of claim 1.

4,344,942

PHARMACOLOGICAL USE OF CYPROTERONE ACETATE

Manlio Blandamura, Rome, Italy, assignor to Finchimica S.R.L., Milan, Italy

Filed Jul. 1, 1981, Ser. No. 279,545

Int. Cl.³ A61K *31/56*

U.S. Cl. 424—243 **2 Claims**

1. The method of treating women having cystic glandular hyperplasia of the endometrium by administering a pharmaceutically-acceptable dosage of cyproterone acetate.

2. The method of claim 1 wherein said dosage is done orally in the range of 200–400 mg daily.

4,344,943

6-CHLORO- OR 6-BROMO-1,2-DIHYDRO-3H-PYRROLO[1,2-a]-PYRROLE-1-CARBOXYLIC ACIDS AND DERIVATIVES THEREOF

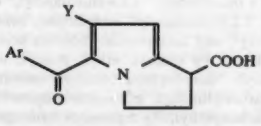
Joseph M. Muchowski, Sunnyvale, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jun. 9, 1980, Ser. No. 157,719

Int. Cl.³ A61K *31/40, 31/52*; C07D *487/04*; C07F *1/08*

U.S. Cl. 424—245 **34 Claims**

1. A compound selected from the group of those represented by the formula

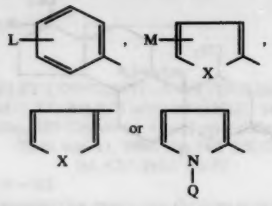


(A)

and the pharmaceutically acceptable, non-toxic alkyl esters having from 1 to 12 carbon atoms and salts thereof, wherein

Y is chloro or bromo and

Ar has the formula



in which

X is sulfur or oxygen;

L is hydrogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, Br, Cl, F, CN, CF_3 or $S(O)_nR^3$

wherein R^3 is alkyl having 1 to 4 carbon atoms and n is 0, 1 or 2;

M is hydrogen, methyl, Cl or Br; and

Q is hydrogen or alkyl having 1 to 4 carbon atoms.

28. A composition for treating inflammation, pain or pyrexia in mammals consisting essentially of a pharmaceutically acceptable non-toxic excipient and a therapeutically effective amount of a compound of claim **1**.

30. A composition for administration to a pregnant mammal to delay onset of parturition consisting essentially of a pharmaceutically acceptable non-toxic excipient and a therapeutically effective amount of a compound of claim **1**.

4,344,944

7-α-METHOXYCEPHALOSPORIN DERIVATIVES, AND ANTIBACTERIAL DRUGS ONCTAINING THE SAME

Yoshimasa Machida, Wako; Isao Saito, Aza-Sori; Seiichiro Nomoto, Tokyo; Shigeto Negi, Kodaira; Hironori Ikuta, Tokyo, and Kyosuke Kitoh, Kawagoe, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

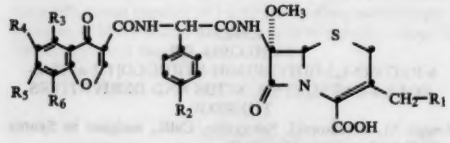
Filed Dec. 29, 1980, Ser. No. 220,723

Claims priority, application Japan, Mar. 4, 1980, 55-26112; Jul. 8, 1980, 55-92199

Int. Cl.³ C07D *501/36*

U.S. Cl. 424—246 **9 Claims**

1. A 7α-methoxycephalosporin derivative represented by the formula:



wherein R_1 represents nitrogen-containing heterocyclic-thio, the nitrogen-containing heterocyclic moiety of which is selected from the group consisting of pyrrolyl, pyridyl and its N-oxide, imidazolyl, pyrazolyl, pyrimidinyl, pyridazinyl, 1H-1,2,4-triazolyl, 4H-1,2,4-triazolyl, 1H-1,2,3-triazolyl, 2H-1,2,3-triazolyl, 1H-tetrazolyl, 2H-tetrazolyl, thiazolyl, 1,2,3-thiadiazolyl, 1,2,4-thiadiazolyl, 1,3,4-thiadiazolyl, oxazolyl, 1,3,4-oxadiazolyl, 1,2,5-oxadiazolyl, morpholino, benzothiazolyl and benzoxazolyl, said heterocyclic moieties being unsubstituted or substituted by methyl, ethyl, propyl, isopropyl, dimethylaminoethyl, dimethylaminomethyl, diethylaminoethyl, methoxycarbonylmethyl, ethoxycarbonylmethyl, carboxymethyl or carboxyethyl; R_2 represents hydrogen or hydroxy; and R_3, R_4, R_5 and R_6 each represents a group selected from the class consisting of hydrogen, hydroxy, lower alkanoyloxy, methoxy, ethoxy, propoxy, methyl, ethyl, n-propyl, i-propyl, n-butyl, t-butyl, halogen, benzyloxy, phenethyloxy, nitro, methoxycarbonyloxy, ethoxycarbonyloxy and 2,2,2-trichloroethoxycarbonyloxy, or a pharmaceutically acceptable salt thereof.

4,344,945

PIPERIDINE DERIVATIVES

Masayuki Teranishi; Hiroyuki Obase, both of Machida; Haruki Takai, Kawasaki, all of Japan; Kazuhiro Kubo, Berchem, Belgium, and Yutaka Kasuya, Komukainishi, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

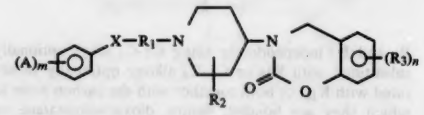
Filed Mar. 9, 1981, Ser. No. 241,727

Claims priority, application Japan, Mar. 10, 1980, 55-29106; May 27, 1980, 55-69619

Int. Cl.³ C07D *413/04;* **A61K** *31/445, 31/535;* **C07D** *498/14*

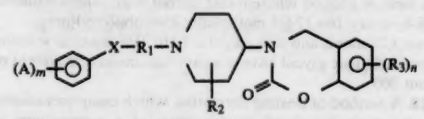
U.S. Cl. 424—248.52 **7 Claims**

1. A compound represented by the formula:



wherein A is hydroxy, halogen, lower alkyl, lower alkoxy, lower alkenyloxy, lower alkinyloxy, lower alkylthio, carboxy, lower alkoxycarbonyl, nitro, amino, lower alkylamino, lower alkanoylamino, sulfamoyl, mono- or di-lower alkylaminosulfonyl, lower alkylsulfonyl, carbamoyl, cyano or trifluoromethyl, m is 0 or an integer of 1–5, and when m is 2 or more, each A is the same group or each A is a different group or two A groups may combine to form lower alkylenedioxy; X is oxygen, sulfur, carbonyl, hydroxymethylene or methylene; R_1 is straight-chain alkylene having 1–4 carbon atoms with or without lower alkyl substituent(s); R_2 is hydrogen or lower alkyl; and R_3 is hydroxy, lower alkoxy, halogen, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, nitro or amino, n is 0 or an integer of 1–4, and when n is 2 or more, each R_3 is the same group or each R_3 is a different group of two R_3 groups may combine to form lower alkylenedioxy and a pharmacologically acceptable acid addition salt thereof.

7. A hypotensive composition which comprises at least one pharmaceutically acceptable carrier, and an effective amount of a compound represented by the formula:



wherein A is hydroxy, halogen, lower alkyl, lower alkoxy, lower alkenyloxy, lower alkinyloxy, lower alkylthio, carboxy, lower alkoxycarbonyl, nitro, amino, lower alkylamino, lower alkanoylamino, sulfamoyl, mono- or di-lower alkylaminosulfonyl, lower alkylsulfonyl, carbamoyl, cyano or trifluoromethyl, m is 0 or an integer of 1–5, and when m is 2 or more, each A is the same group or each A is a different group or two A groups may combine to form lower alkylenedioxy; X is oxygen, sulfur, carbonyl, hydroxymethylene or methylene; R_1 is straight-chain alkylene having 1–4 carbon atoms with or without lower alkyl substituent(s); R_2 is hydrogen or lower alkyl; and R_3 is hydroxy, lower alkoxy, halogen, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, nitro or amino, n is 0 or an integer of 1–4, and when n is 2 or more, each R_3 is the same group or each R_3 is a different group or two R_3 groups may combine to form lower alkylenedioxy or a pharmacologically acceptable acid addition salt thereof.

4,344,946

2,6-DIAMINO-BENZO[1,2-d:5,4-d]BISTHIAZOLES AND SALTS THEREOF

Ernest Cullen, Montreal, Canada; Genus Possanza, Ridgefield, and Patrick B. Stewart, Washington Depot, both of Conn., assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

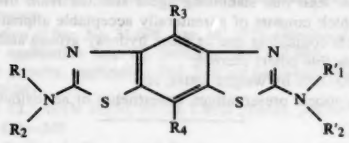
Continuation of Ser. No. 928,827, Jul. 28, 1978, abandoned. This application Aug. 28, 1980, Ser. No. 182,077

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1977, 2736652

Int. Cl.³ A61K *31/495*; C07D *521/00*

U.S. Cl. 424—250 **20 Claims**

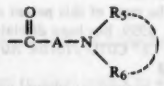
1. A compound of the formula



wherein

R_1 and R_1' are each hydrogen or alkyl of 1 to 2 carbon atoms;

R_2 and R_2' are each hydrogen or



but other than both hydrogen at the same time, where

A is alkylene of 1 to 2 carbon atoms,

R_5 is hydrogen, lower alkyl, lower alkyl-amino-lower alkyl, lower alkoxy-lower alkyl, hydroxycarbonyl-lower alkyl, cycloalkyl of 5 to 8 carbon atoms, lower alkyl-cycloalkyl of 5 to 8 carbon atoms, phenyl or morpholino;

R_6 is hydrogen, lower alkyl, lower alkyl-amino-lower alkyl or lower alkoxy-lower alkyl; or

R_5 and R_6, together with each other and the nitrogen atom to which they are attached, form a piperidino or piperazino ring and said heterocyclic rings may optionally have one or two lower alkyl substituents, a lower alkoxy-carbonyl, a lower alkoxy-carbonyl-methyl, a hydroxy-lower alkyl, a trifluoroethyl, a cycloalkyl of 5 to 7 carbon atoms, a lower alkyl-cycloalkyl of 5 to 7 carbon atoms, a cyclohexylmethyl, a benzyl, a pyridyl, a piperidino, a phenyl, a fluoro-phenyl, a chloro-phenyl, a trifluoromethyl-phenyl, or an acetyl-phenyl substituent attached thereto; and

R_3 and R_4 are each hydrogen, chlorine, bromine, lower alkyl, lower alkoxy, lower alkanoyl, hydroxy-carbonyl, lower alkoxy-carbonyl, amino-carbonyl, phenyl, trifluoromethyl, nitro, cyano or amino;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

20. The method of relieving arthritis or rheumatism in a warm-blooded animal in need thereof, which comprises perorally, parenterally, rectally or topically administering to said animal an effective antiarthritic or antirheumatic amount of a compound of claim **1**.

4,344,947

USE OF ISOPROPYLAMINOPYRIMIDINE IN THE CHEMOTHERAPY OF MUSCULAR DYSTROPHY, MYOPATHY AND MYTONIA

Pierre M. Huve, Paris, France, assignor to Societe d'Etudes de Produits Chimiques, France

Filed Oct. 29, 1980, Ser. No. 201,709

Claims priority, application Canada, Nov. 2, 1979, 339073

Int. Cl.³ A61K *31/505*

U.S. Cl. 424—251 **4 Claims**

1. A method for the chemotherapy of muscular dystrophy, myopathy and myotonia and/or muscular neurotransmission which comprises:

administering by injection to an animal afflicted with a condition associated with muscular dystrophy, myopathy, myotonia and/or muscular neurotransmission 2 isopropylaminopyrimidine or therapeutically acceptable salts of the same in an amount effective to improve said condition.

4,344,948

PIPERIDINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Haruki Takai, Kawasaki; Masayuki Teranishi; Nobuhiro Nakamizo, both of Machida; Yutaka Kasuya, Kawasaki, all of Japan, and Kazuhiro Kubo, Berchem, Belgium, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

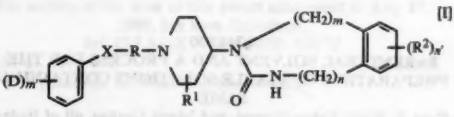
Filed Nov. 21, 1980, Ser. No. 209,284

Claims priority, application Japan, Nov. 21, 1979, 54/150056

Int. Cl.³ C07D *401/04*; A61K *31/505*

U.S. Cl. 424—251 **6 Claims**

6. A pharmaceutical composition which comprises a pharmaceutically acceptable carrier, and an effective amount of a compound represented by the formula [I]:



[I]

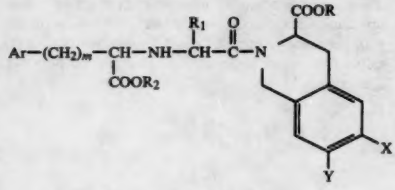
wherein m' is 0 or an integer of 1–5 representing the number of D groups substituted on the ring; D is hydroxy, halogen, lower alkyl, lower alkoxy, lower alkenyloxy, lower alkynyloxy, lower alkylthio, carboxy, lower alkoxycarbonyl, nitro, amino, lower alkylamino, lower alkanoylamino sulfamoyl, mono- or di-lower alkylaminosulfonyl, lower alkylsulfonyl, carbamoyl, cyano or trifluoromethyl, and when m' is 2 or more, each D is the same group or each D is a different group or two D groups may combine to form a lower alkylenedioxy; X is oxygen, sulfur, carbonyl, hydroxymethylene or methylene; R is straight-chain alkylene having 1–4 carbon atoms with or without lower alkyl substituent(s); R^1 is hydrogen or lower alkyl; m and n are 0 or 1, and m and n are different from each other; n' is 0 or an integer of 1–4 representing the number of R^2 groups substituted on the ring; and R^2 is hydroxy, lower alkoxy, halogen, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, nitro or amino, and when n' is 2 or more, R^2 is the same or different or two R^2's may combine to form lower alkylenedioxy or a pharmacologically acceptable acid addition salt thereof.

4,344,949
SUBSTITUTED ACYL DERIVATIVES OF 1,2,3,4-TETRAHYDROISOQUINOLINE-3-CARBOXYLIC ACIDS

Milton L. Hoefle, and Sylvester Klutchko, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 193,767, Oct. 3, 1980, abandoned. This application Feb. 20, 1981, Ser. No. 236,397
Int. Cl.³ A61K *31/47;* **C07D** *217/16, 491/048*
U.S. Cl. 424—258 **15 Claims**

1. A substituted acyl compound of 1,2,3,4-tetrahydroisoquinoline-3-carboxylic acid having the formula



where R is hydrogen, lower alkyl or phenylalkyl; R_1 is hydrogen, lower alkyl, or benzyl; R_2 is hydrogen, or lower alkyl and Ar is phenyl, or substituted phenyl having 1 or 2 substituents selected from the group consisting of fluorine, chlorine, bromine, lower alkyl, lower alkoxy, hydroxy or amino; X and Y are independently hydrogen, lower alkyl, lower alkoxy, lower alkylthio, lower alkylsulfinyl, lower alkylsulfonyl, hydroxy, or X and Y together are methylenedioxy; and m is 0 to 3; wherein lower alkyl, alkyl in the group phenylalkyl; and lower alkoxy has 1 to 4 straight or branched carbon atoms and the pharmaceutically acceptable salts thereof.

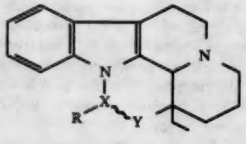
15. A method of treating hypertension by administering an effective amount of a substituted acyl compound of 1,2,3,4-tetrahydroisoquinoline-3-carboxylic acid according to claim 1 or a pharmaceutically acceptable salt thereof.

4,344,950
PARENTERAL SOLVENT AND A PROCESS FOR THE PREPARATION OF STABLE SOLUTIONS CONTAINING SAME

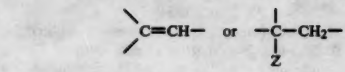
Geza T. Nagy; Gabor Szepesi, and Maria Gazdag, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Oct. 28, 1980, Ser. No. 201,509
Claims priority, application Hungary, Feb. 11, 1979, RI 733
Int. Cl.³ A61K *31/475, 31/435*
U.S. Cl. 424—262 **8 Claims**

1. A parenteral pharmaceutical composition which comprises as active ingredient a pharmaceutically effective amount of a compound of the formula (I)



wherein
X ∩ Y is



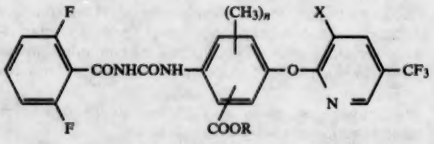
and
Z is hydroxy or cyano, and
R is hydrogen, an alkoxycarbonyl group having 2 to 6 carbon atoms which can be substituted by one or more halogen atoms or hydroxy groups or an aralkoxycarbonyl group, provided that if Z is hydroxy, then R is not simultaneously hdyrogen, along with a parenteral solvent which comprises
(a) a pharmaceutically acceptable buffer or an organic acid having a pK_a equalling 3 to 5capable of adjusting the pH value of the parenteral composition to 2.5 to 5.0;
(b) at least one stabilizing agent selected from the group which consists of parenterally acceptable aliphatic alcohols containing one or more hydroxy groups and water-miscible ethers thereof;
(c) 30–70% by weight water; and
(d) optional preservatives, anaesthetics or antioxidants.

4,344,951
N-BENZOYL N'-PYRIDYLOXY PHENYL UREA

Ryuzo Nishiyama, Takatsuki; Takahiro Haga, Kusatsu; Tadaaki Toki; Tohru Koyanagi, both of Moriyama, and Shigeo Murai, Yookaichi, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 183,650, Sep. 3, 1980, Pat. No. 4,310,530. This application Apr. 1, 1981, Ser. No. 250,077
Claims priority, application Japan, Sep. 7, 1979, 54-114862; Feb. 8, 1980, 55-14430
The portion of the term of this patent subsequent to Jan. 12, 1999, has been disclaimed.
Int. Cl.³ C07D *213/64;* **A01N** *43/40*
U.S. Cl. 424—263 **3 Claims**

1. N-benzoyl N'-pyridyloxy phenyl ureas having the formula



(I)

wherein X represents a halogen atom; R represents a C_1–C_4 alkyl group and n is 0, 1 or 2.

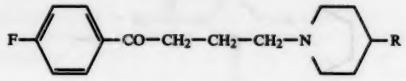
3. An insecticidal composition comprising an effective amount of a N-benzoyl N'-pyridyloxy phenyl urea having the formula (I) according to claim 1 as an active ingredient together with an inert carrier or diluent.

4,344,952
METHOD OF TREATING DIARRHOEA WITH GAMMA-PIPERIDINO-BUTYROPHENONES

Sven E. H. Hernestam, Malmö; Kjell B. Martinsson, Ballingslöv; Erik G. Christensson, Lund, and Nils-Göran E. Olsson, Ödakra, all of Sweden, assignors to AB Ferrosan, Malmö, Sweden

Filed May 30, 1980, Ser. No. 154,863
Int. Cl.³ A61U *31/445*
U.S. Cl. 424—267 **6 Claims**

1. A method of treating diarrhoea in mammals comprising administration to a mammal having diarrhoea of an effective amount of a compound selected from the group consisting of 4-fluoro-γ-(4-alkylpiperidino)-butyrophenone of the formula



wherein R is lower alkyl having 1 to 6 carbon atoms, or pharmaceutically acceptable acid addition salts thereof.

4,344,953

COMBATING PESTS WITH SUBSTITUTED ALKANYLAZOLYL OXIME-CARBAMATES

Jörg Stetter, Wuppertal; Bernhard Homeyer, Leverkusen, and Ingeborg Hammann, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

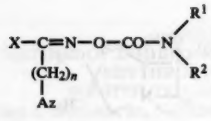
Continuation of Ser. No. 31,098, Apr. 18, 1979, abandoned. This application Aug. 29, 1980, Ser. No. 182,380

Claims priority, application Fed. Rep. of Germany, May 10, 1978, 2820361

Int. Cl.³ A01N *43/50, 43/64;* **C07D** *233/61, 249/08*

U.S. Cl. 424—269 **11 Claims**

1. A substituted alkanyl-azolyl oxime-carbamate of the formula



in which

Az represents an imidazol-1-yl, 1,2,4-triazol-1-yl and 1,3,4-triazol-1-yl radical,

R^1 represents hydrogen or alkyl with 1 to 4 carbon atoms;

R^2 represents hydrogen, alkyl with 1 to 12 carbon atoms, alkenyl with 2 to 4 carbon atoms, alkynyl with 2 to 4 carbon atoms, halogenoalkyl with 2 to 4 carbon atoms and up to 5 halogen atoms or alkoxyalkyl with up to 2 carbon atoms in each alkyl part;

n represents 0 or 1; and

X represents monosubstituted or disubstituted alkyl with 1 to 4 carbon atoms, the substituents being selected from halogen, alkylcarbonyloxy with 1–4 carbon atoms in the alkyl part, carbamoyloxy, alkylcarbamoyloxy and dialkylcarbamoyloxy with in either case 1 to 4 carbon atoms in each alkyl part, alkylsulphonyloxy with 1 to 4 carbon atoms, hydroxyl, nitro, cyano, alkoxycarbonyl with 1 to 4 carbon atoms in the alkyl part and alkoxy and alkylthio with in either case 1 to 4 carbon atoms,

or an acid addition salt or metal salt complex thereof.

4,344,954

2,3-DISUBSTITUTED-2,3,5,6,7,8-HEXAHYDRO-THIAZOLO[3,2-A]-[1,3]DIAZEPIN-3-OLS

Andrew S. Tomcufcik, Old Tappan; William B. Wright, Jr., Woodcliff Lake, both of N.J., and Joseph W. Marsico, Jr., Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

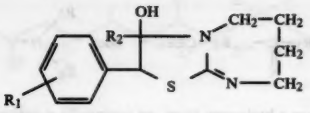
Filed Jul. 9, 1980, Ser. No. 167,088

The portion of the term of this patent subsequent to Aug. 11, 1998, has been disclaimed.

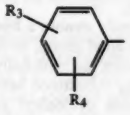
Int. Cl.³ A61K *31/55;* **C07D** *513/04*

U.S. Cl. 424—270 **18 Claims**

1. A compound selected from the group consisting of those of the formula:



wherein R_1 is hydrogen, fluoro, chloro or bromo and R_2 is 3,4-methylenedioxyphenyl, 2-furyl, 3-methyl-2-furyl, 5-methyl-2-furyl, 2-thienyl, 3-methyl-2-thienyl, 5-methyl-2-thienyl or a moiety of the formula:



wherein R_3 and R_4 are each individually selected from the group consisting of hydrogen, fluoro, chloro, bromo, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms and dimethylamino; and the pharmacologically acceptable acid-addition salts thereof.

18. The method of inducing diuresis in a mammal which comprises administering orally to said mammal an effective amount of a compound according to claim **1**.

4,344,955

PENICILLIN 1,1-DIOXIDES

Ekkehard Niemers; Hans-Bodo König; Wilfried Schröck, and Karl G. Metzger, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 12, 1980, Ser. No. 158,975

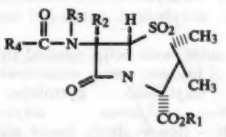
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 2925963

The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.

Int. Cl.³ A61K *31/43;* **C07D** *499/72*

U.S. Cl. 424—271 **9 Claims**

1. A penicillin 1,1-dioxide of the formula



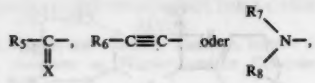
or a pharmaceutically acceptable salt thereof, in which

R_1 denotes a hydrogen atom or an ester-forming radical,

R_2 denotes a hydrogen atom or optionally substituted alkoxy group,

R_3 denotes a hydrogen atom, COR_4, SO_2-alkyl, SO_2-aryl or an optionally substituted alkyl group, but R_2 and R_3 do not simultaneously denote hydrogen atoms, and

R_4 denotes a hydrogen atom, an optionally substituted alkyl group, an optionally substituted alkenyl group, an optionally substituted cycloalkyl group, an optionally substituted cycloalkenyl group, an optionally substituted cycloalkadienyl or aralkyl group, an optionally substituted alkoxy, aralkoxy, aryl, aryloxy or heterocyclyl radical or a radical of the formula



R_5 denotes a hydrogen atom, an optionally substituted alkyl group, an optionally substituted alkoxy, aryloxy or aryl group, an optionally substituted cycloalkyl group, an optionally substituted cycloalkenyl group, an optionally substituted cycloalkadienyl group, or an optionally substituted alkenyl, aralkyl or heterocyclyl radical,

R_6 denotes a hydrogen atom or an optionally substituted alkyl or aryl group,

R_7 and R_8 independently denote a hydrogen atom, an optionally substituted alkyl group, an optionally substituted alkenyl or aryl group, an optionally substituted aralkyl group, an optionally substituted heterocyclyl radical, an optionally substituted cycloalkyl group, an optionally substituted cycloalkenyl group or an optionally substituted cycloalkadienyl group, or R_7 and R_8 together denote a heterocyclyl radical, and

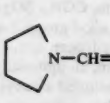
X denotes an oxygen atom, R_9—N or

in which R_9 denotes a hydroxyl group, an optionally substituted alkoxy group, a heterocyclyl radical or a radical of the formula

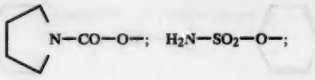
in which

R_{10} and R_{11} independently denote a hydrogen atom, an optionally substituted alkyl, aryl or heterocyclyl radical, a carboxyl group or a functional derivative of a carboxyl group; the heterocyclyl radicals being selected from the group consisting of thienyl, furyl, oxazolyl, isoxazolyl, thiazolyl, isothiazolyl, pyrrolyl, imidazolyl, pyrazolyl, oxdiazolyl, thiadiazolyl, triazolyl, sydnonyl, oxtriazolyl, thiatriazolyl, tetrazolyl, pyridyl, pyrazinyl, pyrimidinyl, tetrahydrofuranyl, dioxanyl, pyrrolidinyl, piperidinyl, morpholinyl, pyron-2-yl and pyron-4-yl, and

the optional substituents being selected from the group consisting of halogen; amino; mono-lower alkylamino; di-lower alkylamino; pyrrolidyl; piperidyl; HCO—NH—; lower alkyl—CO—NH—; H—CO—N— (lower alkyl); lower alkyl—CO—N(-lower alkyl); (lower alkyl)$_2$C=N—; lower alkyl —SO$_2$—NH—; lower alkyl —SO$_2$—N (lower alkyl)—; HO—SO$_2$—NH—; HO—SO$_2$—N (lower alkyl); amidino; (lower alkyl)$_2$—N—CH=N—;



guanido; nitro; azido; hydroxyl; lower alkoxyl; H—CO—O—, lower alkyl—CO—O—; lower alkyl—O—CO—O—; H_2N—CO—O—; lower alkyl—NH—CO—O—; (lower alkyl)$_2$N—CO—O;

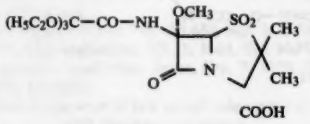


lower alkyl—NH—SO$_2$—O—; (lower alkyl)$_2$N—SO$_2$—O—; HOOC—; H_2N—CO—; (lower alkyl)$_2$—N—CO—; OHC—; HO—SO$_2$—O—; HS—; lower alkyl—S—;

HO_3S—; lower alkyl—SO$_2$— or H_2N—SO$_2$—; lower alkyl—NH—SO$_2$—; (lower alkyl)$_2$ N—SO$_2$—;

HO—SO$_2$—S—; phenyl or phenoxy.

3. A compound according to claim 1, wherein such compound is



or a pharmaceutically acceptable salt thereof.

9. A method of combating bacteria which comprises applying to such bacteria or a habitat thereof an anti-bacterially effective amount of a compound or salt according to claim 3.

4,344,956

OXOTETRAHYDROTHIOPHENES

Nicolo Ercoli, Residencia La Hacienda (23 L) Avenida Principal Las Mercedes, Caracas, Venezuela

Filed Apr. 6, 1976, Ser. No. 674,068

Int. Cl.^{3} A61K *31/42, 31/54;* C07D *333/16;* C09B *23/16*

U.S. Cl. 424—272 **25 Claims**

1. Pharmacologically-active and physiologically-acceptable butyrothiolactonimine which is a Schiff Base of an aminobutyrothiolactone and a penaldate; the butyrothiolactone ring of which is further unsubstituted and the imine nitrogen of which is directly bound to two carbon atoms, one of which is a ring carbon of said butyrothiolactone ring.

4,344,957

BENZ-ACYL-BENZIMIDAZOLE DERIVATIVES AND ANTIALLERGIC COMPOSITIONS

Ernst Habicht, Oberwil; Pier G. Ferrini, Binningen, and Alfred Sallmann, Bottmingen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

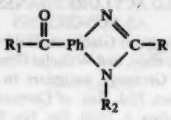
Division of Ser. No. 962,426, Nov. 20, 1978, Pat. No. 4,213,993, which is a division of Ser. No. 825,630, Aug. 18, 1977, Pat. No. 4,141,982. This application Dec. 28, 1979, Ser. No. 107,980

Claims priority, application Luxembourg, Aug. 27, 1976, 75684

Int. Cl.^{3} A61K *31/415;* C07D *235/12*

U.S. Cl. 424—273 B **5 Claims**

1. A benz-acyl-benzimidazole-2 derivative of the formula



in which R is esterified hydroxymethyl containing, as the esterified hydroxyl group, lower alkanoyloxy or benzoyloxy which is unsubstituted or substituted by lower alkyl, lower alkoxy or halogen, R_1 is lower alkyl which is unsubstituted or substituted by lower alkoxy, lower alkylthio, lower alkylsulphinyl, lower alkylsulphonyl, phenylthio, phenylsulphinyl or phenylsulphonyl, or phenyl or phenyl-lower alkyl which are unsubstituted or substituted in the phenyl radical by lower alkyl, lower alkoxy or halogen, or is lower alkenyl or cycloalkyl having 3 to 8 carbon atoms, R_2 is hydrogen or lower alkyl and Ph is 1,2-phenylene which contains the radical of the formula R_1—C(=O)— and is otherwise unsubstituted or substituted by lower alkyl, lower alkoxy, hydroxyl or halogen with the proviso that R_1 contains at least 2 carbon atoms if Ph is otherwise unsubstituted, R_2 is ethyl and R is acetoxymethyl.

5. A pharmaceutical preparation containing an antiallergically effective amount of a compound as claimed in claim 1 together with a conventional pharmaceutical carrier.

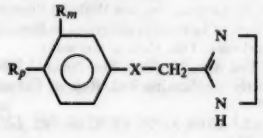
4,344,958

METHOD OF INHIBITING SICKLING OF SICKLE ERYTHROCYTES USING SUBSTITUTED-2-IMIDAZOLINES

Robert J. Broersma, Jr., Noblesville, Ind., and Gayle A. Spittka, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 24, 1980, Ser. No. 200,246
Int. Cl.³ A61K *31/415*
U.S. Cl. 424—273 R **5 Claims**

1. A method for inhibiting the sickling of red blood cells prone to sickle in blood containing said cells which comprises introducing into said blood an effective sickle inhibiting amount of a compound of the formula:



or a pharmaceutically-acceptable salt thereof, wherein X represents sulfur, oxygen or imino; R_m represents chloro, bromo, fluoro or iodo; and R_p represents chloro, bromo, fluoro, iodo, hydroxy, amino or alkyl.

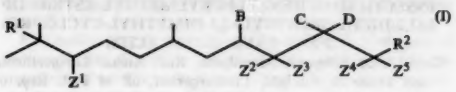
4,344,959

TERPENE DERIVATIVES AND INSECTICIDAL COMPOSITIONS CONTAINING TERPENES

Lajos Novak; Csaba Szantay; Janos Rohaly; Attila Kis-Tamas; Laszlo Varjas, all of Budapest, and Janos Csutak, Kazincbarcika, all of Hungary, assignors to Egyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

Filed Apr. 6, 1981, Ser. No. 251,043
Claims priority, application Hungary, Apr. 11, 1980, 877
Int. Cl.³ A61K *31/365, 31/23;* C07D *307/20*
U.S. Cl. 424—279 **11 Claims**

1. A compound of the formula (I),



wherein

R^1 is hydrogen or a lower alkoxy group and

Z^1 is hydrogen, or

R^1 and Z^1 from together a double bond,

Z^2 is hydrogen and

B is hydroxy, or

Z^2 and B form together a double bond,

Z^3 and Z^4 each stand for hydrogen or they form together an ethylene group, or

Z^4 and D form together a double bond,

C is oxygen atom or a lower alkoxy group,

D is a valence bond if C stands for oxygen, or otherwise D forms a double bond together with Z^4 or Z^5,

Z^5 forms a double bond together with D or represents hydrogen, and

R^2 is a group of the formula —$COOR^3$, wherein R^3 is lower alkyl, or

Z^5 and R^2 form together a 1-oxo-2-oxa-tetramethylene group, with the proviso that if Z^3 and Z^4 form together an ethylene group, R^2 may stand only for a —$COOR^3$ group.

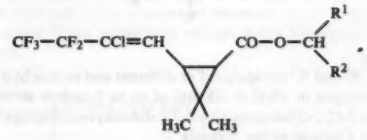
4,344,960

COMBATING INSECTS AND ACARIDS WITH 3-(2-CHLORO-3,3,4,4,4-PENTAFLUORO-1-BUTENYL)-2,2-DIMETHYL-CYCLOPROPANECARBOXYLIC ACID ESTERS

Rainer Fuchs, Wuppertal; Klaus Naumann; Reinhard Lantzsch, both of Leverkusen; Hermann Hagemann; Ingeborg Hammann, both of Cologne; Bernhard Homeyer, Leverkusen; Wolfgang Behrenz, Overath, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 1, 1981, Ser. No. 259,645
Claims priority, application Fed. Rep. of Germany, May 22, 1980, 3019552
Int. Cl.³ A01N *43/30, 53/00;* C07C *121/75;* C07D *317/44*
U.S. Cl. 424—282 **8 Claims**

1. A 3-(2,chloro-3,3,4,4,4-pentafluoro-1-butenyl)-2,2-dimethyl-cyclopropanecarboxylic acid ester of the formula



in which

R^1 represents hydrogen, cyano or an alkyl, alkenyl or alkynyl radical with in each case up to 4 carbon atoms, and

R^2 represents a phenyl radical which is substituted by fluorine and/or by optionally fluorine-substituted C_1–C_2-alkylenedioxy and/or by optionally fluorine-substituted phenoxy, with the proviso that the radical R^2 contains a total of at least one fluorine-substituent.

7. A method of combating insects and acarids which comprises applying to the acarids, or to a habitat thereof, an insecticidally and acaricidally effective amount of a compound according to claim 1.

4,344,961

INSECTICIDAL BENZYLFURYLMETHYL ESTERS OF 3-(2,2-DICHLOROVINYL)-2,2-DIMETHYL-CYCLOPROPANE CARBOXYLIC ACIDS

Gerd-Ulrich Schwarz, Mannheim; Karl Kiehs, Lampertheim, and Heinrich Adolphi, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

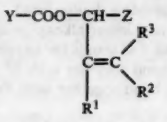
Continuation of Ser. No. 96,520, Nov. 21, 1979, abandoned. This application Feb. 9, 1981, Ser. No. 232,557

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1978, 2852275

Int. Cl.³ A01N *43/08;* C07D *307/45*

U.S. Cl. 424—285 6 Claims

1. A carboxylic acid ester of the formula I



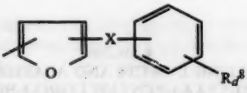
I

where

R^1, R^2 and R^3 are identical or different and each is hydrogen, halogen or alkyl or alkenyl of up to 5 carbon atoms,

Y is 3-(2,2-dihalogenovinyl)-2,2-dimethyl-cyclopropyl,

Z is a radical of the formula



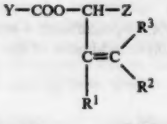
where

X is —CH_2—,

R^8 is halogen or alkyl, alkoxy or haloalkyl of up to 5 carbon atoms and

d is from 0 to 3.

6. A process for combating insects and arachnids, wherein the insects or arachnids or the objects to be protected against insect and arachnid attack are treated with an effective amount of a carboxylic acid ester of the formula I



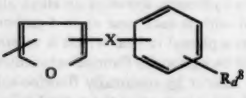
I

where

R^1, R^2 and R^3 are identical or different and each is hydrogen, halogen or alkyl or alkenyl of up to 5 carbon atoms,

Y is 3-(2,2-dihalogenovinyl)-2,2-dimethyl-cyclopropyl,

Z is a radical of the formula



where

X is —CH_2—,

R^8 is halogen or alkyl, alkoxy or haloalkyl of up to 5 carbon atoms and

d is from 0 to 3.

4,344,962

SULPHENYLATED ACYLURETHANES AND THEIR USE AS FUNGICIDES

Engelbert Kühle, Bergisch Gladbach; Wilfried Paulus; Hermann Genth, both of Krefeld, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

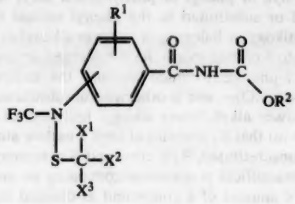
Filed Sep. 8, 1980, Ser. No. 184,676

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1979, 2938111

Int. Cl.³ C07C *145/02;* A01N *47/20*

U.S. Cl. 424—300 6 Claims

5. A fungicidal composition comprising a fungidical effective amount of a compound of the formula



(I)

wherein

R^1 denotes hydrogen, halogen, nitro, alkyl, alkoxy or halogenomethyl,

R^2 denotes alkyl, alkenyl, alkinyl, cycloalkyl or aralkyl and

X^1, X^2 and X^3 are identical or different and denote halogen and a diluent.

4,344,963

PESTICIDALLY ACTIVE 2-PHENYL-ALK-1-ENYL-CYCLOPROPANE-CARBOXYLIC ACID ESTERS

Rainer Fuchs, Wuppertal; Ingeborg Hammann, Cologne; Bernhard Homeyer, Leverkusen, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

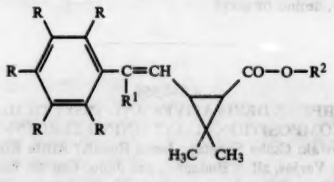
Filed Apr. 25, 1980, Ser. No. 143,958

Claims priority, application Fed. Rep. of Germany, May 23, 1979, 2920947

Int. Cl.³ A01N *53/00;* C07C *69/743, 121/75*

U.S. Cl. 424—304 11 Claims

1. A 2-phenyl-alk-1-enyl-cyclopropanecarboxylic acid ester of the formula

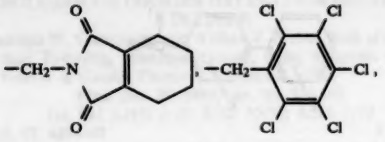


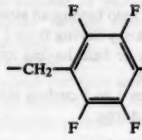
in which

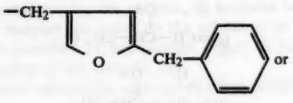
R each independently is hydrogen, halogen, cyano, nitro and, in each case optionally halogen-substituted, alkyl, alkoxy, alkylenedioxy or alkylthio,

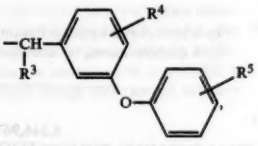
R^1 is optionally halogen-substituted alkyl, and

R^2 is









R^3 is hydrogen, cyano, ethynyl, methyl or ethyl, and R^4 and R^5 each independently is hydrogen, fluorine, chlorine or bromine.

10. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthropodicidally effective amount of a compound according to claim 1.

4,344,964

1-(ALKANOYLAMINO-ARYLOXY)-2-HYDROXY-3-(ALKINYL-AMINO)-PROPANES AND SALTS THEREOF

Herbert Köppe; Werner Kummer; Helmut Stähle; Gojko Muacevic, all of Ingelheim am Rhein, and Werner Traunecker, Münster-Sarmsheim, all of Fed. Rep. of Germany, assignors to C. H. Boehringer Sohn, Ingelheim am Rhein, Fed. Rep. of Germany

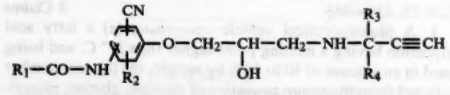
Filed Mar. 9, 1981, Ser. No. 241,519

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1980, 3009036

Int. Cl.³ A61K *31/275;* **C07C** *121/78*

U.S. Cl. 424—304 **6 Claims**

1. A compound of the formula



wherein

R_1 is ethyl or isopropyl;

R_2 is hydrogen, halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or a bivalent radical —CH=CH—CH=CH— or $-(CH_2)_n-$, where n is an integer from 3 to 5, inclusive, and the free bonds of said bivalent radical are attached to adjacent carbon atoms of the phenyl ring; and

R_3 is hydrogen or alkyl or 1 to 3 carbon atoms;

R_4 is alkyl of 1 to 3 carbon atoms; or

R_3 and R_4, together with each other, are $-(CH_2)_p-$, where p is an integer from 4 to 6, inclusive,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

5. A method for the treatment and prophylaxis of diseases of the coronaries, for the treatment of hypertension, or for the treatment of cardiac arrhythmia, which comprises administering to a warm-blooded animal or human an effective amount of a compound of claim 1.

4,344,965

ANESTHETIC COMPOSITIONS CONTAINING BENZOCAINE

Raymond Stone, 177 Woodsdale Ave., Dover, Del. 19901

Continuation of Ser. No. 951,046, Oct. 13, 1978, abandoned. This application Mar. 26, 1980, Ser. No. 134,069

Int. Cl.³ A61K *31/245*

U.S. Cl. 424—310 **6 Claims**

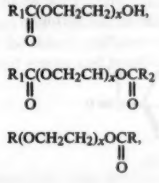
1. An anesthetic composition containing benzocaine, suitable for a pump dispenser and having stability at room temperature and a resistance to low temperature and being relatively nonflammable, said composition comprising:

(1) a solution of at least 10% benzocaine in a nonvolatile solvent, and

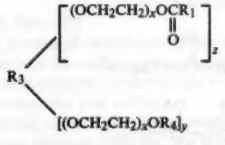
(2) a diluent of a mixture of water and alcohol, said nonvolatile solvent being selected from the group consisting of

$$R(OCH_2CH_2)_xOH$$

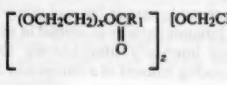
in which R is alkyl containing 7 to 19 carbon atoms and in which the ratio of the total number of ether groups per molecule to the molecular weight of the nonvolatile solvent is not less than 0.0033 or in which R is phenyl or monosubstituted alkyl phenyl or polysubstituted alkyl phenyl in which the number of carbon atoms in each alkyl group (R_5) is 1 to 19, and in which the ratio of the total number of ether groups per molecule to the molecular weight of the nonvolatile solvent is not less than 0.0055,



in which R_1 and R_2 are alkyl, containing 7 to 19 carbon atoms, and in which the ratio of the total number of ester groups and ether groups per molecule to the molecular weight of the nonvolatile solvent is not less than 0.0055, and



in which R_3 is a radical remaining after all the hydroxyl groups of a polyhydric alcohol have been removed,



are connected to the positions of R_3 from which the hydroxyl groups were removed, R_4 is selected from the group consisting of hydrogen and

and z are whole numbers and y+z is equal to the original number of hydroxyl groups in the polyhydric alcohol which was the precursor of the radical R_3, in which the ratio of the total number of ether groups per molecule to the molecular weight of the compound is not less than 0.0055, in which x is a whole number such that the minimum value of the ratio of the total number of ethylene oxide groups, (OCH_2CH_2), to the total number of functional groups present of at least one of the group selected from the group of ester groups, phenoxy groups, alkyl phenoxy groups, and terminal alkoxy groups per molecule is 5, and in which the maximum number of ethylene oxide groups per molecule is 135;

said alcohol is selected from the group consisting of isopropanol, n-propanol and ethanol,

the ratio of diluent to benzocaine solution in a nonvolatile solvent is, by weight, from 0.6/1 to 8/1,

and the ratio of water to alcohol is, by weight, from 0.8/1 to 5.6/1.

4,344,966

ANTI-INFLAMMATORY 1-ALKYL-1-PHENYL-BUTANES

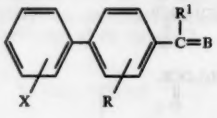
Paul L. Anderson, Dover, N.J., and Darryl A. Brittain, New York, N.Y., assignors to Sandoz, Inc., E. Hanover, N.J.

Continuation of Ser. No. 867,789, Jan. 9, 1978, abandoned, which is a division of Ser. No. 633,460, Nov. 19, 1975, Pat. No. 4,081,476, Continuation-in-part of Ser. No. 390,035, Aug. 20, 1973, abandoned. This application Jan. 8, 1980, Ser. No. 110,442

Int. Cl.³ A61K *31/065, 31/085, 31/22*

U.S. Cl. 424—343 **11 Claims**

1. A pharmaceutical composition suitable for use as an anti-inflammatory comprising a compound of the formula:



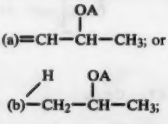
wherein

X is a hydrogen atom; halo having an atomic weight of from about 19 to 80, or alkoxy having from 1 to 4 carbon atoms;

R is a hydrogen atom or halo having an atomic weight of from about 19 to 80;

R^1 is alkyl having from 1 to 3 carbon atoms; and

B is either of the structures:

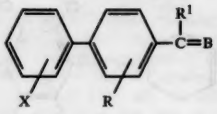


in which

A is a hydrogen atom or alkanoyl having from 2 to 4 carbon atoms, or acetoacetyl;

and a pharmaceutically acceptable carrier for said compound.

7. A method of treating inflammation in an animal in need of such treatment, comprising internally administering to said animal an inflammation-reducing amount of a compound of the formula:



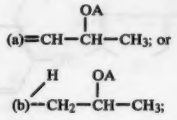
wherein

X is a hydrogen atom, halo having an atomic weight of from about 19 to 80; or alkoxy having from 1 to 4 carbon atoms;

R is a hydrogen atom or halo having an atomic weight of from about 19 to 80;

R^1 is alkyl having from 1 to 3 carbon atoms; and

B is either of the structures:



in which A is a hydrogen atom or alkanoyl having from 2 to 4 carbon atoms, or acetoacetyl.

4,344,967

FILM FORMING COMPOSITION AND USES THEREOF

Ian A. Easton, Glasgow, Scotland; James M. Glen, and Ann G. Kieran, both of Bathurst, Australia, assignors to Devro, Inc., Somerville, N.J.

Filed Aug. 1, 1980, Ser. No. 174,313

Claims priority, application United Kingdom, Aug. 7, 1979, 7927460

Int. Cl.³ A61K *47/00*

U.S. Cl. 424—359 **5 Claims**

1. A non-gelling, film-forming composition comprising a stable aqueous solution containing 25% to 40% by weight of partially hydrolysed collagen protein solids having a molecular weight of from 3,000 to 45,000 and from 1% to 10% by weight glycerol.

4,344,968

PHARMACEUTICAL VEHICLE

Yukio Aoda, Tokyo; Hiroshi Ninomiya, Sayama; Kooichi Yoshida, Soka, and Osamu Koyanagi, Yono, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1979, Ser. No. 101,707

Claims priority, application Japan, Dec. 9, 1978, 53-152221

Int. Cl.³ A61K *9/02, 9/22, 9/26, 31/78*

U.S. Cl. 424—365 **5 Claims**

1. A pharmaceutical vehicle comprising (a) a fatty acid glyceride having a melting point higher than 37° C. and being used in an amount of 40 to 80% by weight, (b) (b) one member selected from the group consisting of alamine, glycine, phenylalanine, leucine, isoleucine, valine, lysine, proline, serine, glucose, maltose, mannitol, fructose, galactose, lactose, dextrose, xylitol, sorbitol, mannose, sucrose, dextrin, dextran, xylann, carragheenin, mannan, an alginic acid ester of propyleneglycol, soluble starch, gum arabic, tragacamth gum, α-cyclodextrin, β-cyclodextrin, galactan and inulin: said substances having a particle size smaller than 28 mesh and being used in an amount of 10 to 50% by weight, (c) sodium polyacrylate having a particle size smaller than 28 mesh and being used in an amount of 0.2 to 2% by weight, and (d) a water-soluble surface active agent being used in an amount of 0.05 to 5% by weight.

4,344,969

SINGLE-DOUGH COOKIES HAVING STORAGE STABLE TEXTURE

Rudolph W. Youngquist, and William J. Brabbs, both of Springfield Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 29, 1980, Ser. No. 220,603
Int. Cl.[3] A21D *2/00, 8/02, 10/00;* A23L *1/10*
U.S. Cl. 426—18 7 Claims

1. A cookie dough capable of providing, when baked, a crumb-continuous cookie having storage-stable crisp and chewy textures, comprising:

(a) a carbohydrase enzyme;

(b) a buffer system which provides an initial pH in the cookie dough sufficient to inactivate the enzyme;

(c) a readily crystallizable sucrose-containing carbohydrate component, at least a part of the carbohydrate component being a substrate for the enzyme, in amounts sufficient, after the enzyme has acted on the substrate, to produce sufficient quantities of non-sucrose sugars to inhibit the crystallization of the sucrose; and

(d) the balance comprising non-carbohydrate cookie ingredients;

(e) the non-carbohydrate cookie ingredients including shortening having a leavening acid incorporated therein, the leavening acid being capable of reacting with the buffer system when the shortening is melted so as to provide a pH in a portion of the cookie dough sufficient to activate the enzyme.

4,344,970

STABILIZATION OF MILK AND IMPROVED CHEESE YIELDS

Robert R. Zall, and David J. Dzurec, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Nov. 18, 1980, Ser. No. 207,861
Int. Cl.[3] A23C *3/02, 19/05*
U.S. Cl. 426—40 3 Claims

1. A process for increasing the yield of cottage cheese or quarg which comprises:

heating fresh milk within a few hours after leaving the cow, under non-pasteurizing conditions of at least about 150° C., to result in a product which is still raw by the phosphatase analysis and which has a reduced level of flavor-affecting bacteria;

aging the heated milk under refrigerated condition for a period between at least two days and the time that noticeable change in flavor occurs;

pasteurizing the milk and processing the pasteurized milk into cottage cheese or quarg.

4,344,971

PRESERVATION OF FRUITS AND VEGETABLES

John T. Garbutt, Muscatine, Iowa, assignor to Grain Processing Corporation, Muscatine, Iowa

Continuation-in-part of Ser. No. 195,525, Oct. 9, 1980, abandoned. This application Mar. 31, 1981, Ser. No. 249,727
Int. Cl.[3] A23L *1/212*
U.S. Cl. 426—102 26 Claims

16. A fruit or vegetable having thereon a preserving coating of a protein obtained by treating a protein-containing liquid with an anionic surface active agent containing not less than 8 carbon atoms to precipitate protein therefrom, said coating being effective to reduce the moisture loss and to extend the shelf life of said fruit or vegetable.

4,344,972

HERBAL CENTER DROP AND PROCESS FOR ITS PREPARATION

Horst Wienecke, Gross-Gerau, Fed. Rep. of Germany, assignor to Richardson GmbH, Gross-Gerau, Fed. Rep. of Germany

Filed May 23, 1980, Ser. No. 152,698
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1979, 2925229
Int. Cl.[3] A23G *3/00;* A23L *1/221*
U.S. Cl. 426—103 3 Claims

1. A process for preparing bonbons with a herbal core comprising the steps of adding ultra-fine comminuted herbal parts having a particle size smaller than 1.0 mm, in an amount sufficient to impart a herbal flavor, to a viscous filling material having a temperature of 85° to 120° C., to form a mixture; cooling the mixture to a temperature of about 80° to 95° C.; and, pumping said mixture into a hard bonbon candy coat.

4,344,973

METHOD FOR CURING AND SMOKING PORK SKINS TO CONDITION THEM FOR RENDERING

Anthony A. Blake, 816 Forest Hills Dr., and Neil W. Blake, 5309 Clear Run Dr., both of Wilmington, N.C. 28403

Continuation-in-part of Ser. No. 203,951, Nov. 4, 1980, abandoned. This application Oct. 2, 1981, Ser. No. 308,123
Int. Cl.[3] A23B *4/02, 4/04*
U.S. Cl. 426—264 9 Claims

1. A method of curing and smoking pork skins preparatory to them being rendered and popped, said method comprising the steps of, prior to rendering or popping said skins, applying a curing solution to the skins; applying a liquid smoke to the skins; continuously passing the skins through an enclosure; blowing heated air over the skins to dry the exposed surface of the skins in a portion of said enclosure; then applying direct heat from a heat source to said skins for a predetermined time in another portion of said enclosure; and regulating the temperature of said heat, the proximity of said skins to the source of heat, and said predetermined time so that the internal temperature of the skins is sufficient to activate the curing solution and the liquid smoke and insufficient to render the skins.

4,344,974

PROCESS FOR DECAFFEINIZING RAW COFFEE

Wolfgang Sirtl, Bad Homburg, Fed. Rep. of Germany, assignor to Kaffee-Veredelungs-Werk Koffeinfrei Kaffee GmbH & Co., Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 819,257, Jul. 27, 1977, abandoned. This application Jun. 13, 1980, Ser. No. 159,356
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634535
Int. Cl.[3] A23F *5/20*
U.S. Cl. 426—271 11 Claims

1. A process of decaffeinizing raw coffee, which comprises:

extracting the caffeine from the raw coffee by circulating humid nitrogen oxide N_2O gas in a hypercritical condition through the raw coffee,

removing the caffeine laden, humid hypercritical nitrogen oxide N_2O gas from the raw coffee,

and immediately separating the caffeine from the humid hypercritical nitrogen oxide N_2O gas by passing the hypercritical nitrogen oxide N_2O gas through an ion exchanger containing functional groups capable of establishing a chemical bond between the ion exchanger and the caffeine thereby allowing the gas to pass away from the ion exchanger while leaving the caffeine with the ion exchanger.

4,344,975

PROCESS FOR THE PRODUCTION OF AGGLOMERATED BREAD CRUMBS

Werner Seiler, Züiberwangen, Switzerland, assignor to Gebruder Buhler AG, Uzwil, Switzerland

Filed Mar. 7, 1980, Ser. No. 128,155

Claims priority, application Switzerland, Mar. 15, 1979, 2505/79; Fed. Rep. of Germany, May 16, 1979, 2919845

Int. Cl.³ A21D *2/00*

U.S. Cl. 426—285 19 Claims

1. Process for the production of bread crumbs, usuable as an instant product, which comprises providing a starch-containing raw material selected from the group consisting of flour, grits, semolina and meal, humidifying said material to a water content of 20 to 50% by weight while subjecting said material to agglomerating conditions resulting in the formation of agglomerates, baking the agglomerates in hot steam until a gelatinization degree of 50 to 100% is achieved, and drying the agglomerates whereby agglomerated bread crumbs are obtained from the dried product.

4,344,976

PROCESS FOR RECOVERING MEAL AND OIL FROM RAW FISH

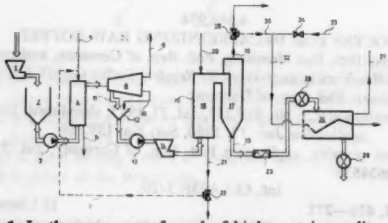
Per Bladh, Jarna, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Nov. 26, 1980, Ser. No. 210,849

Claims priority, application Sweden, Nov. 30, 1979, 7909929

Int. Cl.³ A23L *1/31, 1/325*

U.S. Cl. 426—472 11 Claims



1. In the recovery of meal of high protein quality and oil from fish, the process which comprises heating a fish mass obtained by disintegrating raw fish, separating and removing oil from the heated fish mass by subjecting said mass to a centrifuging operation and separately discharging a separated oil phase from said operation, discharging stick water and sludge from the centrifuging operation, feeding a mixture of the stick watr and sludge to an evaporating zone and there passing the mixture in plug-flow through indirectly heated tube means while continuously cleaning the inner walls of said tube means by scraping said inner walls, thereby obtaining an evaporated product and steam in said tube means, separating said evaporated sludge-containing product from said steam, and drying said evaporated product.

4,344,977

SMOKED FISH PRODUCTS WHICH INHIBIT THE GROWTH OF *CLOSTRIDIUM BOTULINUM* AND THE FORMATION OF ENTEROTOXIN

John S. Thompson, Wayne, Pa., and Joseph F. Jadlocki, Jr., Mount Holly, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 184,689, Sep. 8, 1980, Pat. No. 4,227,507, which is a continuation-in-part of Ser. No. 140,328, Apr. 14, 1980, Pat. No. 4,282,260. This application Jun. 22, 1981, Ser. No. 275,580

The portion of the term of this patent subsequent to Jul. 7, 1998, has been disclaimed.

Int. Cl.³ A23B *4/02;* A23L *1/325*

U.S. Cl. 426—532 7 Claims

1. A smoked fish product which inhibits the growth of *Clostridium botulinum* and the production of enterotoxin during storage of said fish product, containing an alkali metal nitrite salt, in an amount less than about 120 ppm, and from about 1,000 ppm to about 3,000 ppm of a compound selected from the group consisting of hypophosphorous acid, sodium hypophosphite, potassium hypophosphite, calcium hypophosphite and manganese hypophosphite.

4,344,978

PREPARATION OF HOP EXTRACTS RICH IN PARTICULAR CONSTITUENTS

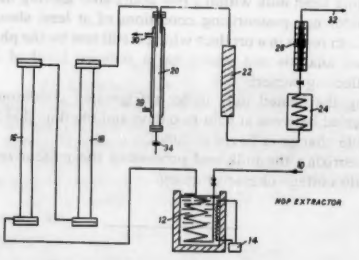
Frederick R. Sharpe, Croydon; Christopher M. Grimmett, East Grinstead, and Derek R. J. Laws, Bexleyheath, all of England, assignors to The Brewing Research Foundation, England

Filed May 19, 1980, Ser. No. 150,987

Claims priority, application United Kingdom, May 24, 1979, 7918075

Int. Cl.³ C12C *3/00*

U.S. Cl. 426—600 7 Claims



1. A single stage method of forming a hop extract containing a high proportion of a desired constituent selected from hop oil, α-acids and β-acids, which method comprises passing fluid carbon dioxide under superatmospheric pressure through a packed column of hops in comminuted form having a weight average particle diameter in the range 0.25 mm to 1.0 mm, for a period of time to effect the desired extraction, collecting separate fractions of the extract obtained at intervals during the said period, and selecting the fraction having a high proportion of the desired constituent, whereby there is obtained a fraction of the extract containing at least 55% by weight of α-acids and not more than 15% by weight of β-acids and containing at least 25% by weight of the available α-acids in the starting hops.

4,344,979

PROCESS FOR THE PREPARATION OF COATED SEEDS

Ignace Gago, Braine-l'Alleud, and Guillaume Coppens, Brussels, both of Belgium, assignors to Interox (Societe Anonyme), Brussels, Belgium

Filed Apr. 1, 1980, Ser. No. 136,268
Int. Cl.[3] A01C 1/06
U.S. Cl. 427—4 21 Claims

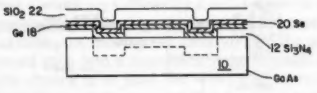
1. Process for the preparation of coated seeds, comprising: (a) treating the seeds with an aqueous phase which is selected from aqueous solutions containing an agent which is capable of limiting the swelling of the seeds and aqueous phases containing an agent which is capable of forming a water impermeable film on the surface of the seeds; (b) coating the treated seeds with a coating agent containing a peroxide compound and a hydrophilic polymer; and (c) drying the coated seeds.

4,344,980

SUPERIOR OHMIC CONTACTS TO III–V SEMICONDUCTOR BY VIRTUE OF DOUBLE DONOR IMPURITY

Max N. Yoder, Falls Church, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 25, 1981, Ser. No. 247,423
Int. Cl.[3] H01L 21/22, 21/265
U.S. Cl. 427—38 15 Claims



1. A process for fabricating superior ohmic contacts in group III–V compound semiconductor materials comprising the steps of:

selecting a substrate wafer composed of a III–V compound, III and V designating groups of elements in the periodic table of elements;

implanting the substrate material through one surface with impurity ions from an element from groups II, IV or VI of the periodic table, the element being ionizable to provide charge carriers in the substrate, the impurity element being implanted at a fluence level or under temperature conditions which damage the lattice sites of the substrate material;

coating said one surface with a pair of elements which, when diffused into the substrate material, provide ions which become substitutional on opposite sub-lattice sites and act together to provide charge carriers of the same polarity, either donors or acceptors;

diffusing said pair of elements into a selected portion of the ion-implanted region;

forming an electrode on said surface of said wafer over said selected portion of the ion-implanted region.

4,344,981

METHOD FOR MODIFYING SURFACE PROPERTIES OF A SHAPED ARTICLE OF A SILICONE

Kiyoshi Imada, Omiya; Susumu Ueno, Ibaraki; Yasuhide Nishina, Ibaraki, and Hirokazu Nomura, Ibaraki, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 11, 1980, Ser. No. 158,407
Claims priority, application Japan, Jun. 18, 1979, 54-76445
Int. Cl.[3] B05D 3/06; B01J 19/08
U.S. Cl. 427—40 3 Claims

1. A method for modifying the surface properties of a shaped article of a silicone to increase its affinity for water and decrease its electrostatic surface charge which comprises the steps of:

(a) subjecting the surface of the shaped article to exposure to a low temperature plasma of an inorganic gas, and

(b) within 24 hours after completion of step (a), bringing the plasma-treated surface of the shaped article into contact with an aqueous solution containing a surface active agent, wherein the length of time in which the plasma-treated surface of the shaped article is in contact with the aqueous solution containing a surface active agent is at least one second, and the concentration of the surface active agent in the aqueous solution is in the range from about 0.01 to 10% by weight.

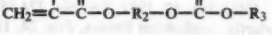
4,344,982

CARBONATE-ACRYLATE OR ALKYLACRYLATE RADIATION CURABLE COATING COMPOSITIONS AND METHOD OF CURING

Albert C. Chen, East Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 31, 1980, Ser. No. 221,645
Int. Cl.[3] B05D 3/06; C08F 2/46
U.S. Cl. 427—44 10 Claims

1. A radiation curable composition comprising 20 to 80 weight percent of a monomer of the formula:



in which

R_1 is H or alkyl of 1 to 4 carbons;

R_2 is an alkylene or alkylene ether radical of 2 to 6 carbon atoms;

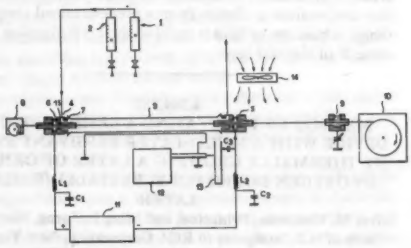
R_3 is alkyl of 1 to 12 carbon atoms; cycloalkyl or substituted cycloalkyl of 5 to 12 carbon atoms; phenyl or substituted phenyl; and 20 to 80 weight percent of a polyfunctional acrylate or polyfunctional alkyl-substituted acrylate cross-linking agent.

4,344,983

PROCESS AND APPARATUS FOR MANUFACTURING FILAMENTS OF A REFRACTORY MATERIAL BY HIGH-FREQUENCY HEATING

Andre A. Grange, Vert le Petit, and Jean A. Corbe, Ballancourt, both of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Apr. 14, 1980, Ser. No. 140,292
Claims priority, application France, Apr. 24, 1979, 79 10334
Int. Cl.[3] C23C 11/00
U.S. Cl. 427—46 8 Claims



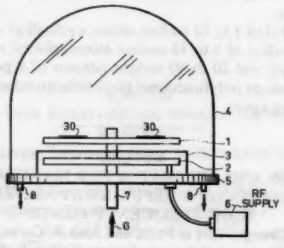
1. Process for continuously depositing a refractory material, in particular boron, from a gaseous mixture, decomposable by pyrolysis, onto a conductive filament which consists of advancing said conductive filament through a tubular reactor, heating said filament by means of the Joule effect, selectively heating said conductive filament by means of a high-frequency current and directly injecting onto the filament said high-frequency current.

6. Apparatus for depositing a refractory material, in particular boron, from a gaseous mixture, decomposable by pyrolysis, onto a conductive filament, which consists of a tubular reaction chamber, capable of producing by capillarity both a seal and at the same time an electrical contact for the purpose of heating, inlet means for supplying the reactive gaseous mixture to the chamber, an outlet means for discharging the by-products from the pyrolysis and the excess reacting gas and a high-frequency heating means coupled directly to the conductive filament, wherein the length of the conductive filament within the reaction chamber is between $\frac{1}{4}$ and $\frac{1}{2}$ the wave length of the high frequency power generated by said high frequency generator and the apparatus includes means defining a high frequency ground connection (9) to said conductive filament at a predetermined distance from said outlet means (5), said predetermined distance being about $\frac{1}{4}$ of said wave length and the apparatus comprises an isolation capacitor which isolates the high frequency current from the direct current.

4,344,984
PROCESS FOR PRODUCING A LAYER CONTAINING SILICON

Daniel Kaplan; Pierre Landouar, and Eric Criton, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 17, 1981, Ser. No. 274,381
Claims priority, application France, Jun. 24, 1980, 80 13968
Int. Cl.[3] H01L *31/18, 31/02, 31/06;* C23C *11/06*
U.S. Cl. 427—74 8 Claims



1. A process for producing a layer containing silicon by deposition on a support, wherein it comprises the introduction during deposition of at least one other element of column IVa of the periodic classification in a proportion equal to or below 5% of the number of silicon atoms and equal to or greater than 0.1% of the number of silicon atoms and wherein the deposition temperature is chosen from a predetermined temperature range, whose lower limit is equal to the crystallization temperature T of the said layer.

4,344,985
METHOD OF PASSIVATING A SEMICONDUCTOR DEVICE WITH A MULTI-LAYER PASSIVANT SYSTEM BY THERMALLY GROWING A LAYER OF OXIDE ON AN OXYGEN DOPED POLYCRYSTALLINE SILICON LAYER

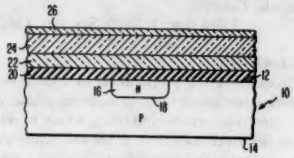
Alvin M. Goodman, Princeton, and Ming L. Tarng, Mercerville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 27, 1981, Ser. No. 248,208
Int. Cl.[3] H01L *21/316*
U.S. Cl. 427—85 8 Claims

1. A method of forming a multi-layer passivation system on the surface of a semiconductor substrate, said method comprising:

depositing an oxygen doped polycrystalline silicon layer on the surface of the substrate; and

thermally growing a layer of oxide on the exposed surface of the oxygen doped polycrystalline silicon layer, the oxide layer extending partially into the thickness of the oxygen

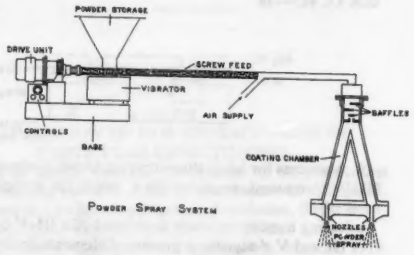


doped polycrystalline silicon layer, while simultaneously annealing the polycrystalline silicon layer.

4,344,986
METHOD OF DELIVERING POWDER COATING REACTANTS

Vern A. Henery, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 8, 1980, Ser. No. 176,322
Int. Cl.[3] B05D *1/12;* C03C *17/23*
U.S. Cl. 427—180 8 Claims



1. In a method of coating a substrate with a film by contacting a surface of the substrate with a powder coating reactant which comprises the steps of:

a. dispersing said powder coating reactant in a carrier gas stream;

b. delivering the powder coating reactant/carrier gas mixture to a coating chamber; and

c. delivering the powder coating reactant/carrier gas mixture from the coating chamber to the surface to be coated

the improvement which comprises creating turbulence in the powder/gas mixture by means of at least one baffle at the entrance of the coating chamber.

4,344,987
PREPARATION OF FLAKY MICA PIGMENTS COATED WITH METAL OXIDES, AND USE OF THESE PIGMENTS

Werner Ostertag, Gruenstadt; Knut Bittler, Speyer, and Gustav Bock, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

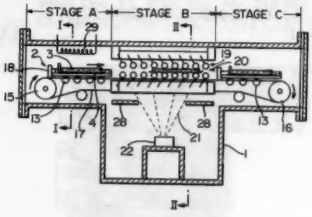
Filed Jul. 24, 1981, Ser. No. 286,605
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1980, 3030056
Int. Cl.[3] C04B *31/26*
U.S. Cl. 427—213 7 Claims

1. A process for the preparation of a flaky mica pigment coated with metal oxide, wherein a vaporizable metal carbonyl is oxidized with oxygen at an elevated temperature in the presence of mica flakes which are kept in motion, with the proviso that the amount of carbonyl introduced into the reaction zone does not exceed 5% by volume, based on the amount of the other gases introduced.

4,344,988
METHOD FOR FORMING PATTERNED COATING

Kenzo Sono, Nishinomiya, and Shiyunji Kuramoto, Kobe, both of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Continuation of Ser. No. 929,989, Aug. 1, 1978, abandoned. This application Jun. 10, 1981, Ser. No. 272,117
Int. Cl.³ C23C 11/00
U.S. Cl. 427—255.5 5 Claims



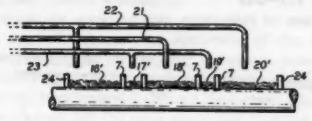
1. A method for forming a coating of a desired pattern on the surface of a substrate which comprises covering the substrate surface with a sheet-like mask having openings corresponding to the desired pattern and directing a film-forming substance from a source toward the substrate surface through the mask, wherein relative to a press member having a plurality of slits, each slit having a width w_2 sufficiently smaller than the width w_1 of the substrate for preventing movement of said mask with respect to said substrate, moving the substrate and the mask in the superimposed state into a deposition stage through a vacuum deposition device in at least the widthwise direction of said plurality of slits in such a manner that the mask is located on the undersurface of the substrate, which mask has a thickness of 300μ or less, said press member being urged against the mask to secure close adherence between the mask and the substrate, and wherein a film-forming substance is directed toward the substrate through said plurality of slits of the press member during this relative movement, said film-forming substance being directed against the bottom of the substrate by means of an evaporant source located at the bottom of the vacuum deposition device; said press member being constructed of a lower and upper part forming a gap therebetween, each of said lower and upper parts being constructed of a plurality of cylindrical rolls aligned in parallel to one another at intervals of w_2 in which w_2 represents a distance of 50 mm or less, whereby said substrate and mask combination pass through the gap formed between said upper and lower parts of the press member and wherein a shield plate for shielding the film-forming substance is provided both at the inlet and outlet of the deposition stage between the lower press member and the evaporation source to avoid deposition of the film at the inlet and outlet ends of the substrate where the contact between the substrate and mask is not close enough.

4,344,989
MULTIZONAL BINDER IMPREGNATION

Alan Thornton, Halifax, and John S. Uttley, Hebden Bridge, both of England, assignors to Bondina Ltd., Yorkshire, England

Division of Ser. No. 571,888, Apr. 25, 1975. This application Feb. 25, 1977, Ser. No. 772,056
Claims priority, application United Kingdom, Mar. 1, 1974, 9438/74
Int. Cl.³ B05D 5/00
U.S. Cl. 427—286 8 Claims

1. A method of making interlining material in which said interlining material comprises a web of non-woven fibers, said web comprising zones which each have substantially uniform binder content and in which adjacent said zones have different binder contents, the method comprising uniformly applying a liquid binder to each said zone so that said zone has a uniform binder content therein, the content of binder which is applied to adjacent zones being different, the binder employed being a liquid binder composition which is a viscous or foam composition and is applied to the web by doctoring as the web passes between a support surface and a doctoring means that confines

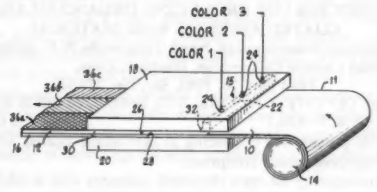


the pool of composition of the web across the width of the web and in which this pool is divided into at least two sections by a baffle that prevents or restricts to a controlled amount transfer of composition from one section to another, different compositions being supplied to adjacent sections.

4,344,990
PROCESS AND APPARATUS FOR COATING STRIP ARTICLES AND THE LIKE

Carl A. Wollam, Cortland; J. Lynn Gailey, Newton Falls, and Alexander A. Chalmers, Warren, all of Ohio, assignors to Alcan Aluminum Corporation, Cleveland, Ohio

Filed Jan. 21, 1981, Ser. No. 226,697
Int. Cl.³ B05C 3/02; B05D 3/02, 3/12, 5/00
U.S. Cl. 427—286 10 Claims



1. A process for coating a major surface of a strip article of indeterminate length, including the steps of

(a) continuously advancing the article longitudinally past a dam extending transversely of said major surface in adjacent spaced relation thereto while

(b) supplying a wet flowable coating material to said major surface immediately ahead of said dam to establish a continuous layer of said coating material on said major surface, and,

(c) immediately beyond said dam, advancing said article longitudinally past a wall of extended length in the direction of strip advance and facing said major surface and spaced therefrom at all points by said layer of wet coating material while

(d) uniformly restraining the article against movement of said major surface away from said wall beyond a predetermined distance equal to a desired wet thickness of said coating material on said major surface,

wherein the improvement comprises

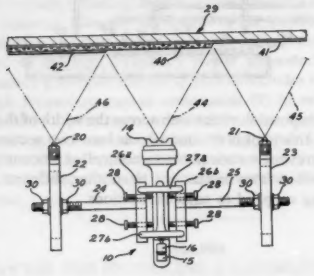
(e) restraining said article as aforesaid by an endless surface moving continuously in the same direction and at the same rate as said article.

4,344,991

WATER-BORNE TOPCOAT SPRAY METHOD

Richard L. Gray, Louisville, Ky., assignor to Reliance Universal, Inc., Louisville, Ky.

Filed Jan. 19, 1981, Ser. No. 226,063
Int. Cl.³ B44D 1/08
U.S. Cl. 427—325 8 Claims



1. Method of applying water-borne emulsion topcoat finishing material to furniture surfaces and the like, namely inflexible, hard wood, wood-based, or plastic prefinished surfaces the method comprising:

projecting an atomized spray of said water-borne emulsion toward the surface to be finished;

and simultaneously projecting at least one spray of atomized water toward said surface, the water spray being adjacent to the emulsion spray but so directed and so spaced therefrom as to avoid substantial intermingling of the emulsion and water sprays in the air space leading to said surface.

4,344,992

PROCESS FOR PRODUCING ORGANO-SILANE COATED ASBESTOS BASE MATERIAL

Sundaresan Ramachandran, North Tonawanda, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 30, 1981, Ser. No. 278,963
Int. Cl.³ C07F 7/10; C09K 7/00; B05D 1/18; B32B 9/00
U.S. Cl. 427—430.1 2 Claims

1. A process for producing organo-silane coated asbestos base material which comprises:

(i) contacting an open chrysotile asbestos with a soluble di or trivalent metallic salt in an aqueous medium,

(ii) adding organo-silane to said aqueous medium to thereby provide an organo-silane coating on said asbestos material, and

(iii) recovering the organo-silane coated asbestos base material from said aqueous medium.

4,344,993

PERFLUOROCARBON-POLYMERIC COATINGS HAVING LOW CRITICAL SURFACE TENSIONS

Donald L. Schmidt; Malcolm E. Pruitt, both of Midland, Mich., and Keith I. Dismuke, Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 2, 1980, Ser. No. 182,892
Int. Cl.³ B05D 7/22; B08B 17/02; B32B 1/02
U.S. Cl. 428—35 8 Claims

1. A coating composition comprising (1) a linear hydrophilic polymer, (2) a cyclic sulfonium zwitterion capable of crosslinking the hydrophilic polymer and (3) a perfluorocarbon having a $—CF_3$ group and an ionic or potentially ionic group, said zwitterion being present in an amount sufficient to crosslink the composition to an adherent, nonreactive coating that is insoluble in water and hydrocarbon, said hydrophilic polymer and perfluorocarbon being present in amounts such that the coating has a critical surface tension of wetting less than 15 dynes/cm.

4,344,994

SIGN LETTERING MATERIALS

Mark J. Batty, London, England, and Thomas Groth, Ljan, Norway, assignors to Letraset USA, Inc., Paramus, N.J.

Filed Feb. 21, 1979, Ser. No. 16,601
Claims priority, application United Kingdom, Feb. 17, 1978, 6434/78
Int. Cl.³ A61F 13/02; G09F 7/16
U.S. Cl. 428—41 8 Claims

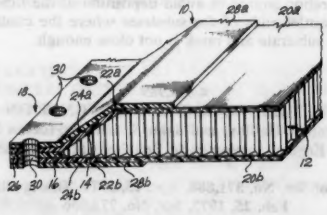
1. A sign lettering material comprising a set of die cut letters each of said letters being individually adhesively mounted on a backing tile, the tile being substantially rectangular and formed in two portions separated by a split running substantially horizontally across the letter and enabling removal of one portion of the tile to leave part of the letter with its adhesive surface exposed and the remainder of the letter adherent to the other portion of the tile, wherein, in the case of at least some of the letters, one portion of the tile has in each corner, constituting a corner of the substantially rectangular tile a stepped notch having one or more steps, and at least some of the letters in the set having at least two steps on the notches of their respective tiles.

4,344,995

HYBRID COMPOSITE STRUCTURES

Robert H. Hammer, Kirkland, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 15, 1980, Ser. No. 187,247
Int. Cl.³ B32B 3/12, 23/02, 3/10
U.S. Cl. 428—61 6 Claims



1. A lightweight composite structure having a honeycomb core and means for joining to other structures comprising: a honeycomb core, a layer of graphite reinforced on each side of the core with the layer terminating adjacent an area to be joined with a fastener, a layer of aramid reinforced resin abutting the graphite reinforced resin layer on each side of the honeycomb and extending over the join area, a layer of aramid reinforced resin to cover the join area and to overlap the graphite resin layer to form a composite structure, and holes

through the fastening area for accepting fasteners to join the composite to other structures.

4,344,996

SURFACE TEXTURING OF FLUOROPOLYMERS

Bruce A. Banks, Olmsted Township, Lorain County; Michael J. Mirtich, N. Olmsted, and James S. Sovey, Strongsville, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 19, 1980, Ser. No. 218,588
Int. Cl.³ B32B *27/16*; C23C *15/00*; C23F *1/00*
U.S. Cl. 428—141 14 Claims

1. A method of treating the surface of a fluoropolymer for improved bonding without altering the chemistry of the same, comprising the steps of

applying a layer of randomly disbursed fine mesh particles of a sputter-resistant material having diameters in the range between about 0.1 μm and 10 μm to said surface thereby masking the same,

placing said fluoropolymer in a vacuum environment of about 4×10^{-5} torr,

exposing said masked surface to a beam of ions having an ion beam current density between 0.1 mA/cm² and 1.0 mA/cm² to texture the same,

moving said fluoropolymer from said vacuum environment to ambient pressure, and

removing said masking particles from said textured surface.

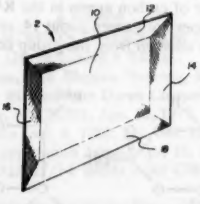
14. A fluoropolymer treated according to the process of claim 1.

4,344,997

ARTISTS' MEDIUM

Rolland Paquette, P.O. Box 58 (Hwy. 69 North), Val Caron, Ontario, Canada

Continuation of Ser. No. 816,369, Jul. 18, 1977, abandoned. This application Aug. 14, 1980, Ser. No. 178,219
Claims priority, application Canada, Jun. 7, 1977, 279993
Int. Cl.³ B32B *3/30, 3/28*
U.S. Cl. 428—161 2 Claims



1. A laminated artists' medium consisting of:

a rigid non-planar backing ahving a surface contour selected from one of the following shapes: a concave shape, a convex shape, a rectangular base with planar sides adjacent thereto, each side flared integrally from the base above the plane of the surface of the base at an angle thereto so that the base and sides are visible at one time by the viewer, and a triangular base with planar sides adjacent thereto, each side extending integrally from the base above the plane of the surface of the base at an angle thereto so that the base and sides are visible at one time by the viewer;

a flexible artists' canvas worksheet;

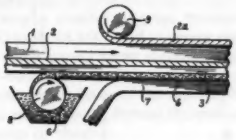
adhesive means for securing said worksheet to said rigid backing, applied between the underside of the artists' canvas worksheet and the backing, the canvas worksheet being thereby secured flush and conforming to the entire surface of the backing and forming a laminate in which the canvas worksheet has the same nonplanar contours as the surface of the backing.

4,344,998

METALLIZED COMPOSITE STRUCTURE AND A METHOD OF PREPARING SAME

Johannes A. N. de Leeuw, Apeldoorn, and Johannes T. Brugmans, Enkhuizen, both of Netherlands, assignors to Koninklijke Emballage Industrie Van Leer, Amstelveen, Netherlands

Filed Apr. 7, 1980, Ser. No. 137,945
Claims priority, application Netherlands, Feb. 15, 1980, 8000967
Int. Cl.³ B32B *7/12, 15/04*
U.S. Cl. 428—212 10 Claims



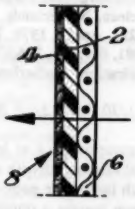
1. A metallised vapour coated composite structure comprising a non-metallic substrate, a laminating adhesive layer on one face of said substrate, a vapor deposited metal stratum on said adhesive layer, and a lacquer coating on said stratum, said composite structure having a reflectivity of at least 85%, a heat emission of about 8% of the Stefan-Boltzmann constant at 23° C., a mirror reflectivity of at least 4 and dead fold properties that are the same as those of the substrate, said lacquer coating being obtained from a carrier film wherein liquid lacquer has a contact angle of zero degrees after application to the carrier surface.

4,344,999

BREATHABLE LAMINATE

Daniel J. Gohlke, Newark, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Apr. 22, 1980, Ser. No. 142,628
Int. Cl.³ B32B *7/02*
U.S. Cl. 428—212 11 Claims



1. A flexible layered article suitable for use in hospital gowns and the like, or tents, which permits transfer of water vapor preventing build-up of internal moisture comprising:

(a) a flexible inner layer of hydrophobic material having a moisture vapor transmission rate exceeding 1000 gms./m^2. day and an advancing water contact angle exceeding 90 degrees; and

(b) a continuous outer hydrophilic layer attached to the outer face of said inner hydrophobic layer, said hydrophilic layer having a moisture vapor transmission rate exceeding 1000 gms./m^2. day, said outer hydrophilic layer containing a particulate solid pigment and a liquid antistatic agent dispersed throughout said hydrophilic layer to impart color and antistatic properties to said layered article but not impair its moisture vapor transmission property.

4,345,000

TRANSPARENT ELECTRICALLY CONDUCTIVE FILM

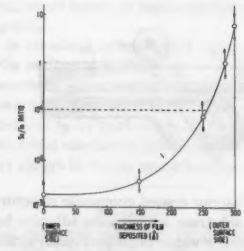
Shozo Kawazoe; Takao Matsui, and Takahiko Moriuchi, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 15, 1980, Ser. No. 216,740

Claims priority, application Japan, Dec. 15, 1979, 54-163211; Dec. 15, 1979, 54-163212

Int. Cl.[3] **B32B** *7/02;* **B05D** *5/12;* **B32B** *5/16, 15/08*

U.S. Cl. 428—212 **5 Claims**



1. A transparent electrically conductive film comprising a metallic oxide, wherein the metallic component comprises from 60 to 95 wt% indium and from 40 to 5 wt% tin, formed on the surface of a plastic base, and wherein the weight ratio of the tin to the indium changes continuously from the outer surface to the inner surface in such a manner that the ratio on the inner surface of the film is appreciably lower than the average ratio of the film and the ratio of the outer surface of the film is appreciably higher than the average ratio of the film.

4,345,001

PROCESS FOR THE MANUFACTURE OF WATER-HARDENING MATERIAL REINFORCED WITH OPEN MESHED FILMS

Jan M. J. M. Bijen, Munstergeleen, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Division of Ser. No. 26,221, Apr. 2, 1979. This application Jul. 24, 1981, Ser. No. 286,679

Claims priority, application Netherlands, Apr. 1, 1978, 7803508

Int. Cl.[3] **B28B** *1/30, 3/12, 5/02;* **B22B** *13/02*

U.S. Cl. 428—286 **3 Claims**

1. A shaped article comprised of at least one layer of a water-hardening material reinforced with at least five unfibrillated organic films which have been provided with meshes so as to form networks, each having a plurality of said meshes, wherein the number of networks in said layer and the average number of meshes in said networks with a minimum of three per square centimeter are such that the average number of meshes per cubic centimeter of said layer is greater than 200.

4,345,002

NOVEL INTUMESCENT COMPOSITION AND FLAME RETARDANT ARTICLES TREATED THEREWITH

Ray E. Smith, Lake Buena Vista, Fla.; Jayendra G. Shukla, and Richard R. Nicholson, both of Ann Arbor, Mich., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.

Continuation-in-part of Ser. No. 939,628, Sep. 5, 1978, abandoned. This application Sep. 17, 1979, Ser. No. 76,041

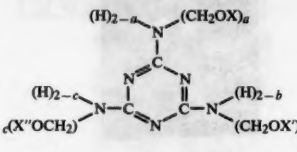
The portion of the term of this patent subsequent to May 6, 1997, has been disclaimed.

Int. Cl.[3] **C09D** *5/18;* **D04H** *1/58*

U.S. Cl. 428—288 **43 Claims**

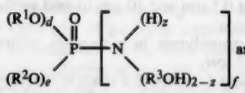
1. An intumescent composition containing a cyclic nitrogen compound, a hydroxy-containing organo-phosphorus compound, an organo-phosphorus acid, and water, wherein:

(a) said cyclic nitrogen compound is:



wherein a, b, and c are integers selected from the group consisting of 1 and 2, a plus b plus c equal about 3 to 6, X, X′, and X″ are independently selected from the group consisting of hydrogen and —CH_3;

(b) said hydroxy-containing organo-phosphorus compound is selected from the group consisting of:

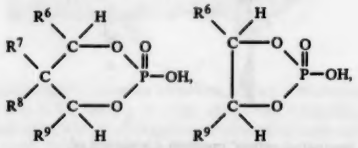


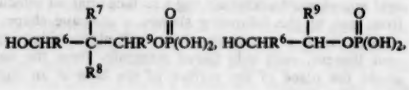
I

II

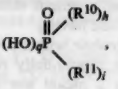
and mixtures thereof, wherein d is an integer of from 0 to 2, e is an integer of from 0 to 2, f is an integer of from 1 to 3, and d plus e plus f equal 3; z is an integer of 0 to 1; x is an integer of 1 to 2, y is an integer of 1 to 2, and x plus y plus z equal 3; R^1, R^2, and R^3 are selected from the group consisting of alkyl radicals containing from about 1 to about 6 carbon atoms and haloalkyl radicals containing from about 2 to about 6 carbon atoms, provided that when R^3 is haloalkyl it contains at least 3 carbon atoms; R^4 and R^5 are selected from the group consisting of hydrogen, alkyl radicals, and haloalkyl radicals, wherein said radicals contain from about 1 to about 6 carbon atoms; and the total number of carbon atoms in the R^1, R^2, R^3, R^4, and R^5 groups does not exceed about 14; and

(c) said acid is selected from the group consisting of

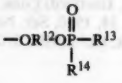




-continued



and mixtures thereof, wherein R^6, R^7, R^8 and R^9 are independently selected from the group consisting of hydrogen, alkyl of from about 1 to about 3 carbon atoms, haloalkyl of from about 1 to about 3 carbon atoms, and hydroxyalkyl of from 1 to about 3 carbon atoms, provided that the total number of carbon atoms in the R^6, R^7, R^8, and R^9 groups does not exceed about 5; wherein q is an integer of from 1 to 2, h and i are integers independently selected from the group consisting of 0, 1, and 2, and 9 plus h plus i equals 3; and wherein R^{10} and R^{11} are independently selected from the group consisting of alkyl of from about 1 to about 6 carbon atoms, haloalkyl of from about 1 to about 6 carbon atoms and from 1 to about 3 halogen atoms, hydroxy-polyalkyleneoxy containing 2 to 6 carbon atoms and 2 to 6 oxygen atoms, alkoxy of from about 1 to about 6 carbon atoms, hydroxyalkoxy of from about 2 to about 6 carbon atoms, haloalkoxy of from about 2 to about 6 carbon atoms and from about 1 to about 3 halogen atoms,



wherein R^{12} is selected from the group consisting of alkylene of from about 2 to about 6 carbon atoms, haloalkylene of from about 3 to about 6 carbon atoms and from about 1 to about 3 halogen atoms, polyalkyleneoxy containing 2 to 6 carbon atoms and 1 to 5 oxygen atoms, and hydroxyalkylene of from 3 to about 6 carbon atoms and 1 to 4 hydroxyls, and R^{13} and R^{14} are independently selected from the group consisting of hydrogen, hydroxyl, alkyl of from about 1 to about 6 carbon atoms, haloalkyl of from about 1 to about 6 carbon atoms and from about 1 to about 3 halogen atoms, hydroxy-polyalkyleneoxy containing about 2 to about 6 carbon atoms and 2 to 6 oxygen atoms, alkoxy of from about 1 to about 6 carbon atoms, hydroxyalkoxy of from about 2 to about 6 carbon atoms, and haloalkoxy of from about 2 to about 6 carbon atoms and 1 to about 3 halogen atoms, provided that the total number of carbon atoms in the R^{10} and R^{11} groups does not exceed about 8.

41. A flame retardant article comprising fibers bonded together with an adhesively-effective and fire-retardingly effective amount of the intumescent composition of claim **1**.

4,345,003

RESOL PHENOLIC RESIN BINDER FOR HOT COATING OF FOUNDRY SAND

Noriaki Matsushima, and Shigeru Nemoto, both of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Japan

Continuation of Ser. No. 29,501, Apr. 12, 1979, abandoned. This application Dec. 4, 1980, Ser. No. 212,936

Claims priority, application Japan, Apr. 18, 1978, 53-44783

Int. Cl.³ B32B *27/14;* **B05D** *7/00;* **C08L** *91/06*

U.S. Cl. 428—327 **16 Claims**

1. A phenolic resin binder in the form of discrete, molded particles useful for hot coating foundry sand, said molded particles comprised of a mixture of solid resol phenolic resin and a lubricant substantially homogeneously dispersed therein, said discrete, molded particles being in the form of beads having a diameter of about 1 to 5 mm or rods having a diameter of about 1 to 5 mm and a length of about 1 to 15 mm.

11. A process for producing resin-coated sand which comprises coating heated sand particles with the binder of claim **1**.

12. A foundry sand composition useful as a foundry sand core or mold prepared by the process of claim **11**.

4,345,004

PROCESS FOR FORMING A COATED FILM OF AN OLEFINIC RESIN

Nobuyoshi Miyata, and Heihachi Murase, both of Hiratsuka, Japan, assignors to Hercules Incorporated, Wilmington, Del.

Filed Apr. 20, 1981, Ser. No. 255,663

Claims priority, application Japan, Apr. 30, 1980, 55-56229

Int. Cl.³ B32B *15/08, 27/38*

U.S. Cl. 428—416 **45 Claims**

1. A process for forming an olefinic resin film on a metal substrate, which comprises

[A] forming a multilayer coated film consisting of an olefinic resin film as a surface layer portion and a cured epoxy resin film as an under layer portion on a metallic substrate by a single coating operation using a multilayer film-forming coating composition comprising as main resinous components

(a) a solid powder containing an olefinic resin having a melt index of 0.3 to 80 g/10 minutes,

(b) a solid powder containing a polar group-containing modified olefinic resin having a melt index of 0.3 to 80 g/10 minutes, and

(c) a film-forming resinous material comprising an epoxy resin having a number average molecular weight of about 350 to about 4,000 and an epoxy equivalent of 150 to 3,800 and a curing agent therefor, and

[B] then heat-bonding an olefinic resin lining material to the olefinic resin surface layer of the multilayer coated film.

45. A metallic article having formed thereon an olefinic resin film by the process of claim **1**.

4,345,005

ORIENTED POLYPROPYLENE FILM SUBSTRATE AND METHOD OF MANUFACTURE

Frank E. All, Newark, and Gary L. Duncan, Pittsford, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 28, 1979, Ser. No. 53,146

Int. Cl.³ B32B *15/08;* **B05D** *3/14*

U.S. Cl. 428—461 **7 Claims**

1. A metal coated oriented polypropylene substrate comprising:

a film comprising a homopolymer polypropylene layer which is from about 80% to 100% isotactic and has a melt index of from about 2 to about 10 grams/10 minutes;

a coextruded ethylene propylene copolymer layer on at least one side of said polypropylene layer, said copolymer containing from about 2% to about 4% by weight of ethylene and from 96% to about 98% by weight of propylene, said polypropylene layer and said copolymer layer containing no slip agent and being biaxially oriented;

at least one copolymer layer being corona discharge treated to provide a surface having enhanced adhesion to a metallized coating; and

a metallized coating on said corona discharge treated copolymer layer, said metallized coating being of a metal selected from the group consisting of aluminum, copper, silver and chromium.

7. A method for producing a metal coated oriented polypropylene substrate comprising:

coextruding a homopolymer polypropylene layer which is from about 80% to 100% isotactic and has a melt index of from about 2 to about 10 grams/10 minutes with an ethylene propylene copolymer layer on at least one side of said polypropylene layer, said copolymer containing from about 2% to about 4% by weight of ethylene and from about 96% to about 98% by weight of propylene, said layer containing either no slip agent or no slip agent which

adversely affects the adhesion of the substrate to a metallized coating;

biaxially orienting said film substrate;

subjecting at least one copolymer surface to corona discharge treatment to enhance adhesion of a metallized coating thereto; and

applying a metallized coating to the corona discharge treated surface, said metallized coating being of a metal selected from the group consisting of aluminum, copper, silver and chromium.

4,345,006

METHOD OF TREATING LEATHER

Hans-Peter Loechel, Belper, and Tom Cooper, Hardingstone, both of England, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Aug. 14, 1981, Ser. No. 292,943

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1980, 3031187

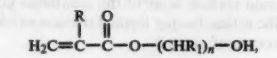
Int. Cl.³ B32B *9/04*

U.S. Cl. 428—473 **8 Claims**

1. A method for treating tanned leather which comprises contacting the leather with a dispersed acrylate resin comprising

60–85 parts by weight of at least one member selected from the group consisting of esters of acrylic acid and esters of methacrylic acid, the homopolymers or copolymers of which esters have a glass transition temperature less than 0° C.;

10–20 parts by weight of at least one hydroxyalkyl acrylate or methacrylate of the formula



$$H_2C=\underset{\displaystyle R}{\overset{|}{C}}-\overset{\displaystyle O}{\overset{\|}{C}}-O-(CHR_1)_n-OH,$$

wherein R is hydrogen or methyl, R_1 is hydrogen or alkyl having 1 to 2 carbo.. atoms, and n is an integer from 2 to 8,

1–10 parts by weight of an α,β-monounsaturated monobasic or dibasic carboxylic acid having 3 to 5 carbon atoms or of a water soluble salt of such an acid;

0.2–2.5 parts by weight of a crosslinking monomer; and

0–2.5 parts by weight of acrylamide or methacrylamide.

5. A treated tanned leather made by the method of claim 1.

4,345,007

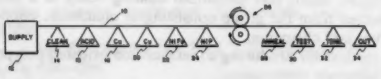
ELECTRO-DEPOSITION OF A NONMAGNETIC CONDUCTIVE COATING FOR MEMORY WIRE PROTECTION

William J. Fahy, Oriskany, and Fred E. Luborsky, Schenectady, both of N.Y., assignors to General Electric Company, Utica, N.Y.

Continuation of Ser. No. 641,457, Dec. 17, 1975, abandoned. This application Sep. 16, 1977, Ser. No. 834,019

Int. Cl.³ B32B *15/00*

U.S. Cl. 428—679 **5 Claims**



1. A memory cell comprising:

a metallic substrate;

a magnetic material comprising a nickel-iron permalloy deposited on the surface of said substrate, and

an essentially sound and unstressed layer of electrically conductive nonmagnetic nickel-phosphorous alloy deposited on the surface of said magnetic material and having a phosphorous content between 8 and 15 percent;

made by the process which includes

passing said substrate at a speed of approximately 18 inches per minute with said magnetic material deposited thereon through a plating cell having

a high sulphate electrolyte with a pH in the range of 2.5 to 3.75 maintained at substantially room temperature, said electrolyte having a nickel ion to hypophosphate ion molar ratio of substantially 3 to 1,

an anode disposed in the electrolyte and electrically coupled to the positive terminal of a DC power supply, said DC power supply being adjusted to supply a current density in the range of 20 through 80 milliamps per square centimeter of plating area,

a cathode in electrical and mechanical contact with said passing memory cell and electrically coupled to the negative terminal of said DC power supply.

4,345,008

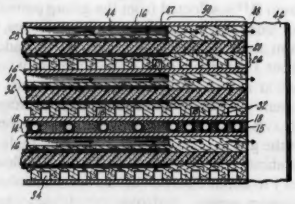
APPARATUS FOR REDUCING ELECTROLYTE LOSS FROM AN ELECTROCHEMICAL CELL

Richard D. Breault, Coventry, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 24, 1980, Ser. No. 219,609

Int. Cl.³ H01M *8/04*

U.S. Cl. 429—26 **4 Claims**



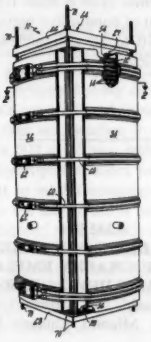
1. An electrochemical cell stack comprising a plurality of cells stacked one on top of the other with gas impervious separator plate means disposed between adjacent cells, each cell comprising a pair of electrodes spaced apart and means for holding a phosphoric acid electrolyte therebetween, wherein the electrolyte evaporates into a reactant gas stream during operation, a first of said electrodes of each cell being made from a first material and being a gas diffusion type porous electrode having a catalyst disposed on a first surface thereof facing said electrolyte holding means and in contact with said electrolyte holding means defining an active zone of said cell, each cell including means for carrying a first reactant gas into operable relationship with said catalyst, and each cell having first reactant gas outlet means on a first side of said stack, said catalyst terminating short of said outlet means, an electrochemically inactive condensation zone being defined within each of said cells between said catalyst and said outlet means, each cell including means for carrying a reactant gas through said active zone and from said active zone into said condensation zone of said cell, the distance between said catalyst and said outlet means being sufficient to effect condensation of electrolyte vapor from the reactant gas as it passes through said condensation zone, said first electrode being constructed and arranged to redistribute the condensed out electrolyte through the active zone of said cell by diffusion or bulk flow within said electrode.

4,345,009

FUEL CELL STACK COMPRESSIVE LOADING SYSTEM

Ronald W. Fahle, Manchester, and Carl A. Reiser, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 17, 1979, Ser. No. 67,577
Int. Cl.³ H01M 2/08
U.S. Cl. 429—37 6 Claims



1. A fuel cell module comprising:

a pair of end blocks, spaced apart;

a large number of fuel cells stacked and under compression between said blocks along an axis perpendicular to the plane of said cells, each cell including a plurality of components, said stack and said blocks forming outwardly facing planar surfaces parallel to said axis;

a reactant gas manifold associated with at least one of said planar surfaces and substantially covering said surface, each manifold including edge means sealed against its respective surface for preventing leakage from said manifold;

constraint means forcing said end blocks toward each other to create a compressive force on said stack of cells in said axial direction, wherein said constraint means and said end blocks are constructed and arranged to result in a stack height of X at room temperature and to prevent any substantial change in stack height due to creep of said fuel cells during the design life of said module;

wherein a stack height Y is the maximum height at which the axial compressive load on said stack still results in acceptable electrical resistance and thermal conductivity through the stack and adequate reactant gas sealing between said cell components;

wherein the thermal expansion characteristics of said module are such that, at maximum operating temperature, the axial distance between said end blocks would increase by an amount ΔX, and $X+\Delta X \leqq Y$ under all conditions;

wherein Z is the lowest axial load on said stack of cells which, at any stack height less than or equal to Y, will ensure acceptable electrical resistance and thermal conductivity through the stack and adequate reactant gas sealing between said cell components; and

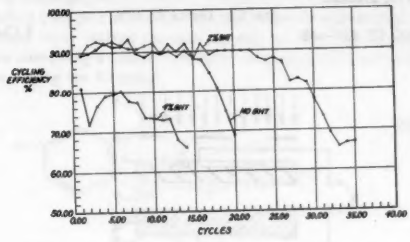
wherein if the compressive force at time zero is F at room temperature, the creep characteristics, thermal expansion characteristics, and spring rate of said stack would result in a reduction of the force F by an amount ΔF over the design life of said module and $F-\Delta F \geqq Z$.

4,345,010

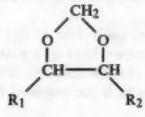
ELECTROLYTE FOR SECONDARY ELECTROCHEMICAL CELL

Paul G. Glugla, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 22, 1980, Ser. No. 218,992
Int. Cl.³ H01M 10/40
U.S. Cl. 429—197 8 Claims



1. In a secondary electrochemical cell wherein the active material of one of the electrodes is lithium metal, the improvement consisting essentially of an electrolyte solution consisting essentially of 2,5-di-tertiary-butyl hydroxytoluene ranging from about 1.5% by weight to less than 4% by weight of a solution consisting essentially of a 1,3-dioxolane or substituted 1,3-dioxolane, which have the formula:



(1)

wherein R_1 and R_2 are the same or different and are hydrogen or alkyl of 1–3 carbon atoms and a lithium salt.

4,345,011

COLOR IMAGING DEVICES AND COLOR FILTER ARRAYS USING PHOTO-BLEACHABLE DYES

Karl H. Drexhage, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 873,441, Jan. 30, 1978, Pat. No. 4,247,799. This application Sep. 11, 1980, Ser. No. 186,105
Int. Cl.³ G03F 5/00
U.S. Cl. 430—7 18 Claims

1. A method of producing a planar array of filter elements comprising the steps of:

(1) forming a layer having a thickness less than 10 microns comprising a transparent binder, a cationic photo-bleachable dye which selectively absorbs radiation in at least one portion of the spectrum, and a sensitizer said dye being present in said layer in an amount sufficient to impart a density to said layer of about 0.5 in that portion of the spectrum in which it selectively absorbs;

(2) exposing said layer to a pattern representing said filter elements so as to photo-bleach said photo-bleachable dye;

(3) fixing said layer by leaching said sensitizer from said layer.

4,345,012
ELECTROPHOTOGRAPHIC METHOD OF GENERATING ELECTROSTATIC IMAGES ON TWO SIDES OF AN INSULATING FOIL

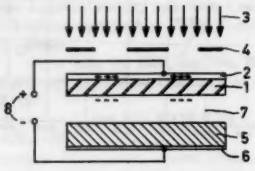
Hans J. Hirsch, Selfkant-Tüddern, and Horst Dannert, Aachen-Walheim, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 25, 1980, Ser. No. 124,406

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1979, 2908603

Int. Cl.³ G03G *13/044*

U.S. Cl. 430—48 **5 Claims**



1. An electrophotographic process comprising the steps of:

providing a highly electrically insulating foil, said foil having first and second opposite sides;

generating identical electrostatic charge images of a radiation image on the first and second opposite sides of the foil, respectively, the charge image on the first side having an opposite sign as compared to the charge image on the second side; and

depositing pigment on each side of the foil, said pigment comprising a developer having a charge whose sign is opposite to that of the electrostatic charge image on the side of the foil on which the pigment is being deposited;

Characterized in that:

the electrostatic charge image is generated on the first side of the foil by generating charge pairs, all charges of one sign from each pair being collected on the first side of the foil, said charge pairs being generated by a reaction between radiation-sensitive material and incident radiation;

the electrostatic charge image is generated on the second side of the foil by a charge exchange between the second side of the foil and an electrode adjacent thereto, said charge exchange effectively collecting all of the remaining generated charges, of opposite sign from the charges on the first side, on the second side of the foil; and

further comprising the step of separating the electrode from the foil prior to depositing the pigment.

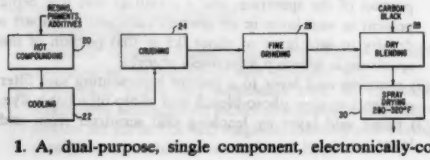
4,345,013
DUAL PURPOSE MAGNETIC TONER

Arthur S. Diamond, Ventura, and Sydney N. Floersheim, Encino, both of Calif., assignors to Black Copy Company, Inc., Canoga Park, Calif.

Filed Feb. 28, 1977, Ser. No. 772,502

Int. Cl.³ G03G *9/14*

U.S. Cl. 430—106.6 **10 Claims**



1. A, dual-purpose, single component, electronically-conductive, magnetically-attractable, toner composition consisting essentially of:

fine, fragmentary, aspherical, acicular particles having a diameter from 10 to 40 microns and consisting essentially of an intimate dispersion of 50 to 150 parts per 100 parts by weight of resin blend of magnetic pigment, and 0 to 15 parts per 100 parts by weight of resin blend of conductive pigment in a homogenous blend of resin consisting of a linear polyester resin having a softening point from 95° C. to 115° C. and an ethylene-vinyl acetate copolymer resin containing 5 to 40% vinyl acetate and the ratio of polyester resin to copolymer resin is from 1:1 to 5:1; and

0.5 to 2.0% by weight of conductive pigment having a particle size of from 10 to 80 millimicrons attached to the surface of the particles.

4,345,014
MAGNETIC BRUSH DEVELOPING METHOD FOR USE IN ELECTROGRAPHY EMPLOYING DUAL-COMPONENT DEVELOPING MATERIAL

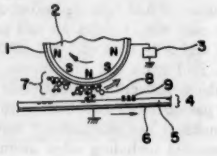
Tateki Oka; Kenji Tabuchi, and Susumu Tanaka, all of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 12, 1980, Ser. No. 186,558

Claims priority, application Japan, Oct. 24, 1979, 54-138029

Int. Cl.³ G03G *13/09*

U.S. Cl. 430—122 **3 Claims**



1. A magnetic brush developing method for use in electrography which comprises the steps of providing a dual-component developing material which includes electrically insulative magnetizable particles as carrier mainly composed of magnetizable powder and bonding material, and electrically insulative non-magnetizable particles as toner mainly composed of coloring material, dye and thermoplastic resin for bonding material; attracting said developing material onto a developing sleeve made of non-magnetizable material, by the action of a magnet member provided in said developing sleeve, to form a magnetic brush of said developing material on said developing sleeve; and bringing said magnetic brush into contact with an electrostatic latent image formed on a recording medium under the impression of a toner fogging prevention bias voltage so as to develop said electrostatic latent image into a visible image; said magnetic brush developing method further including the step of causing silica to adhere onto the surfaces of said electrically insulative non-magnetizable particles to reduce the triboelectric charge on said magnetizable particles to make the magnetic attractive force exerted by said magnet member on said electrically insulative magnetizable particles contacting said recording medium larger than the electric repelling force acting on said magnetizable particles in the direction toward said recording medium, thereby to prevent adhesion of said electrically insulative magnetizable particles to said recording medium.

4,345,015

DISPERSION-HEAT PROCESS EMPLOYING HYDROPHOBIC SILICA FOR PRODUCING SPHERICAL ELECTROPHOTOGRAPHIC TONER POWDER

Roelof R. Hendriksma, Panningen, and Wilhelmus J. VanRhijn, Venlo, both of Netherlands, assignors to Oce-van der Grinten N.V., Venlo, Netherlands

Continuation-in-part of Ser. No. 701,211, Jun. 30, 1976, abandoned. This application Mar. 23, 1977, Ser. No. 780,431
Claims priority, application Netherlands, Jul. 7, 1975, 7508056
Int. Cl.³ G03G 9/08
U.S. Cl. 430—137 8 Claims

1. A process for producing spheroidized toner powder, characterized in that irregularly shaped thermoplastic resin particles, or such particles impregnated with additive, and hydrophobic silica particles having sizes below 100 nanometers are dispersed in a carrier liquid, in which liquid the resin of said resin particles does not dissolve, so as to form a dispersion containing less than 500 g. of said resin particles per liter of carrier liquid and hydrophobic silica particles in a small concentration sufficient to inhibit coagulation of said resin particles when softened; the dispersion is heated with stirring to a temperature at which said resin particles do not melt but soften and acquire a spherical or substantially spherical shape, and this temperature is maintained until substantially all the resin particles have become spherical or practically spherical in shape; the dispersion is then cooled down to a temperature at which the resin particles are no longer sticky and, finally, the resin particles are separated from the dispersion liquid, and dried.

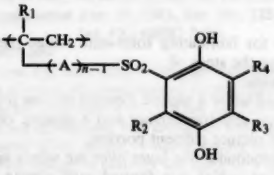
4,345,016

COLOR PHOTOGRAPHIC SENSITIVE MATERIAL

Osamu Takahashi; Nobutaka Ohki, and Kozo Aoki, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 1, 1981, Ser. No. 279,382
Claims priority, application Japan, Jul. 4, 1980, 55/91571
Int. Cl.³ G03C 5/54
U.S. Cl. 430—214 22 Claims

16. In a monosheet type film unit unified in a body before, during and after exposure which is developable in the light, the improvement comprising a photosensitive sheet used for a color diffusion transfer process including an internal latent image type silver halide emulsion layer combined with a dye releasing redox compound and a layer containing a polymer having a repeating unit represented by formula (I)



(I)

wherein A represents a divalent group, n is 1 or 2, R_1 represents hydrogen, a halogen atom or an alkyl group, and R_2, R_3 and R_4 each represents hydrogen, a halogen atom, an alkyl group, an aryl group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, an amino group, an acylamino group, or a sulfonamide group, and R_3 and R_4 together can form an aromatic ring, provided that the total of carbon atoms of R_2, R_3, and R_4 is 60 or less on a base.

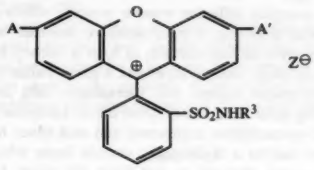
4,345,017

PHOTOGRAPHIC PRODUCTS AND PROCESSES WITH A PH SENSITIVE XANTHENE LIGHT SCREENING DYE

Richard L. Cournoyer, Dorchester, and James W. Foley, Andover, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

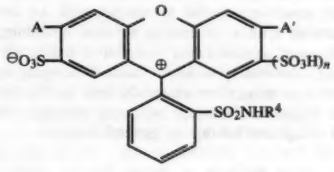
Filed Oct. 6, 1980, Ser. No. 194,468
Int. Cl.³ G03C 7/00, 1/400, 1/84, 5/54
U.S. Cl. 430—221 66 Claims

1. A photographic product comprising a plurality of layers including a support and at least one photosensitive silver halide emulsion layer carried on said support, at least one of said layers containing a colored xanthene compound selected from those having the formulae



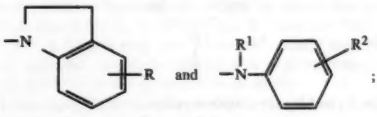
(Ia)

and



(IIa)

wherein A and A', the same or different, are selected from



each R is hydrogen or an electron-withdrawing group; each R^1 is hydrogen or alkyl; each R^2 is hydrogen, alkyl or an electron-withdrawing group; R^3 is hydrogen or alkyl; R^4 is alkyl; n is 0 or 1; and Z is an anion.

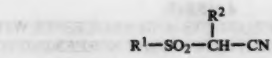
4,345,018

SULFONYL-CYANO ALKANE SILVER HALIDE SOLVENTS

Alan L. Borror, Lexington, and Richard B. Greenwald, Cambridge, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 575,585, May 8, 1975, abandoned. This application Nov. 1, 1976, Ser. No. 737,077
Int. Cl.³ G03C 5/54, 1/48, 5/38
U.S. Cl. 430—234 42 Claims

42. In a photographic silver salt, chemical transfer product comprising (a) a photographic element comprising photographic silver halide, (b) a processing composition, and (c) an image receiving layer comprising development nuclei, said product comprising an organic silver halide complexing agent, the improvement wherein said silver halide complexing agent is a carbon acid of the formula:



wherein R^1 is lower alkyl and R^2 is hydrogen or lower alkyl.

4,345,019

DIFFUSION TRANSFER PROCESS

Isao Kohmura, Nagaokakyo, Japan, assignor to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

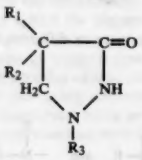
Filed Apr. 17, 1981, Ser. No. 255,287

Claims priority, application Japan, Apr. 23, 1980, 55-53772; Jun. 5, 1980, 55-75961

Int. Cl.³ G03C *5/54*

U.S. Cl. 430—234 **29 Claims**

1. A silver complex diffusion transfer process which comprises imagewise exposing a light sensitive material which comprises a support having thereon at least a carbon black-containing hydrophilic colloid layer and a silver halide emulsion layer contiguous thereto and thereabove, said carbon black-containing layer and/or said silver halide emulsion layer containing a 3-pyrazolidone compound and said silver halide emulsion layer and/or a hydrophilic colloid layer which is permeable to water through or out from the silver halide emulsion layer containing a dihydroxybenzene developing agent, then silver complex diffusion transfer developing thus exposed light sensitive material in contact with an image-receiving material with a processing solution containing at least an alkali agent, a preservative and a silver halide solvent and containing substantially no silver halide developing agent and thereafter separating these materials from each other to form a silver image on the image receiving material, the 3-pyrazolidone compound having the general formula:



wherein R_1 and R_2 are a hydroxyalkyl or an alkyl group of 1–4 carbon atoms, at least one of R_1 and R_2 being a hydroxyalkyl group and R_3 is an aryl group.

4,345,020

POSITIVE RESIST POLYMER COMPOSITION AND METHOD OF FORMING RESIST PATTERN

Yasuhiro Yoneda; Toshisuke Kitakohji, both of Yokohama, and Kenro Kitamura, Fujisawa, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 61,291, filed Nov. 6, 1978 as PCT/JP78/00022, published May 31, 1979 as WO79/00284, § 102(e) date Jul. 2, 1979, § 371 date Jul. 2, 1979, Pat. No. 4,276,365. This application Dec. 3, 1980, Ser. No. 212,609

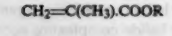
Claims priority, application Japan, Nov. 7, 1977, 52-13337

Int. Cl.³ G03C *1/69*

U.S. Cl. 430—270 **8 Claims**

1. A cross-linkable positive-working resist polymer composition comprising a blend of at least two copolymers, at least one of which is comprised of the following units (a) and (b) and at least one of which is comprised of the following units (a) and (c):

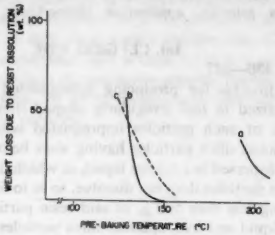
(a) units derived from a methacrylic acid ester of the formula:



where R is selected from the group consisting of alkyls having from 1 to 6 carbon atoms, haloalkyls having from 1 to 6 carbon atoms, benzyl and cyclohexyl,

(b) units derived from a monoolefinically unsaturated carboxylic acid having from 3 to 12 carbon atoms and from 1 to 3 carboxyl groups, and

(c) units derived from methacrylic acid chloride; the amount of the units (b) being such that the number of moles of the units (b), multiplied by the number of the carboxyl groups



in each of the units (b), ranges range from about 1 to about 20% based on the total number of moles of the units (a), (b) and (c); the amount of the units (c) ranges from about 0.05 to about 3.0% by mole, based on the total number of moles of the units (a), (b) and (c); and the molar ratio of the units (b), multiplied by the number of the carboxyl groups in each of the units (b), to the units (c) being greater than 2/1 but less than 250/1.

4,345,021

SOLID-STATE IMAGE PICKUP ELEMENT AND PROCESS FOR FABRICATING THE SAME

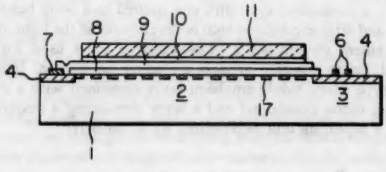
Kazufumi Ogawa, Hirakata; Takao Chikamura, Kyoto, and Takuo Shibata, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 18, 1980, Ser. No. 188,580

Claims priority, application Japan, Sep. 25, 1979, 54/123334; Sep. 25, 1979, 54/123335

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—321 **8 Claims**



1. A process for fabricating solid-state image pickup elements comprising the steps of

preparing a wafer,

forming on said wafer a picture element portion for sensing a light image and transferring and a driving circuit for driving said picture element portion,

forming a photoconductive layer over the whole surface of said wafer on which are formed said picture element portion and said driving circuit, said photoconductive layer being connected to photosensor elements of said picture element portion,

forming a transparent electrode layer over the whole surface of said photoconductive layer,

applying over the whole surface of said transparent electrode layer a photosetting resin which has the optical properties substantially similar or the same as those of an

adhesive agent used for bonding a color filter to said transparent electrode and is transparent to the light in the visible range,

exposing said photosetting resin through a photomask having a predetermined pattern so that the hardened resin pattern is transferred at least to a predetermined portion of said transparent electrode layer corresponding to said picture element portion, and

selectively etching said transparent electrode layer and said photoconductive layer with said hardened resin pattern used as an etching mask.

4,345,022

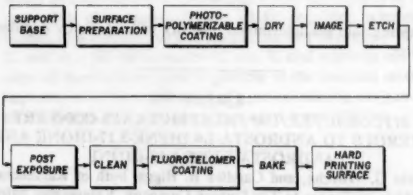
PROCESS OF RECOVERING UNPOLYMERIZED PHOTOPOLYMER FROM PRINTING PLATES

David R. Kress, Rochester, N.Y., assignor to Matrix Unlimited, Inc., Rochester, N.Y.

Division of Ser. No. 93,622, Nov. 13, 1979, Pat. No. 4,269,930. This application Mar. 30, 1981, Ser. No. 249,070

Int. Cl.³ G03C 5/04

U.S. Cl. 430—329 **2 Claims**



1. A process for preparing a photopolymerizable composition of matter comprising:

a. stripping unpolymerized material from an imagewise exposed and photopolymerized printing plate that contains an alcohol-soluble linear polyamide, photosensitizers, polymerization inhibitors, and a low molecular weight dicarboxylic acid or anhydride with a stripping fluid comprised of a mixture of water and a lower aliphatic alcohol;

b. heating the resulting mixture of stripping fluid and stripped photopolymerizable composition to cause phase separation; and

c. recovering the organic phase, which comprises said photopolymerizable composition of matter.

4,345,023

PROCESS FOR INCREASING THE EFFECTIVE SPEED OF PHOTOGRAPHIC FILMS AND IMPROVED FILM STRUCTURES

Charles W. Wyckoff, Needham, Mass., assignor to The Academy of Applied Science, Inc., Belmont, Mass.

Continuation of Ser. No. 943,319, Sep. 18, 1978, abandoned. This application Jan. 16, 1981, Ser. No. 225,534

Int. Cl.³ G03C 7/00

U.S. Cl. 430—364 **5 Claims**

1. A process for increasing during development the effective speed of an exposed silver-sensitized photographic film and the like by a factor of at least 4 to 10 times the ASA speed rating, that comprises developing and fixing the exposed film to provide a reduced silver image; re-halogenating or bleaching said reduced silver image to convert the same to a silver halide or soluble silver complex; and re-developing the film in a color-coupling developer in the presence of color-coupling dye units to reduce the image to silver units and proximal color units, each of the last-mentioned silver units having multiple proximal color units associated therewith as the result of (1) providing of the order of 6 color-coupling dye units in the color-coupling developer for every 2 units of color-coupling developer or (2) repeating the re-halogenating or bleaching and subsequent re-developing a sufficient number of times in the presence of sufficient color-coupling dye units to produce the speed increase.

3. The process as claimed in claim 1, wherein the film is washed and dried with the last-mentioned silver units remaining in the film.

4,345,024

PHOTOGRAPHIC DEVELOPMENT INHIBITOR RELEASING COMPOUND

Shigeo Hirano, and Kei Sakanoue, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

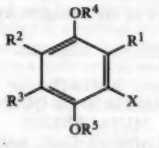
Filed Apr. 30, 1981, Ser. No. 259,278

Claims priority, application Japan, Apr. 30, 1980, 55/57270

Int. Cl.³ G03C 7/00, 1/40

U.S. Cl. 430—382 **12 Claims**

9. A method of forming an image comprising developing an imagewise exposed silver halide photographic light-sensitive material having thereon at least one light-sensitive silver halide emulsion layer in the presence of the photographic development inhibitor releasing compound of the formula (I):



(I)

wherein X is an indazole residue which may be substituted and which is bonded to the benzene nucleus through the nitrogen atom at the 1-position or 2-position thereof; R^1, R^2 and R^3, which may be the same or different, are each hydrogen, an alkyl group, an aryl group, an alkylthio group, an arylthio group, a halogen atom, a hydroxy group, an alkoxy group, an aryloxy group, an acyl group, an alkoxycarbonyl group, an amido group, a sulfonamido group, a carbamoyl group, a sulfamoyl group, a heterocyclic residue or any of the groups described above for X; further R^2 and R^3 may combine with each other to form a ring; and R^4 and R^5, which may be the same or different, are each hydrogen or a group capable of being hydrolyzed in the presence of an alkali.

4,345,025

COLOR PHOTOGRAPHIC SILVER HALIDE LIGHT-SENSITIVE MATERIAL

Morio Yagihara, and Yukio Yokota, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 11, 1981, Ser. No. 242,760

Claims priority, application Japan, Mar. 12, 1980, 55-31321

The portion of the term of this patent subsequent to Oct. 13, 1998, has been disclaimed.

Int. Cl.³ G03C 7/00, 1/40

U.S. Cl. 430—385 **28 Claims**

26. A method of forming color images which comprises developing a photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer with a developing solution containing an aromatic primary amine developing agent in the presence of a colorless photographic cyan color forming coupler having, in a position for coupling with the oxidation product of the aromatic primary amine developing agent, a coupling-off group represented by the following general formula (I):

—O—R—SO—R_1

wherein R represents a substituted straight or branched chain alkylene group or a substituted straight or branched chain alkenylene group; R_1 represents a substituted or unsubstituted

straight or branched chain alkyl group, a straight or branched chain alkenyl group, a straight or branched chain aralkyl group, a straight or branched chain aralkenyl group, a cycloalkyl group, an aryl group or a heterocyclic group, and R and R_1 may be bonded to each other directly or through a connecting group to form a ring.

4,345,026

MUTAGENICITY ASSAY

Kenneth K. Lew, Brookline, Mass., assignor to The Children's Hospital Medical Center, Boston, Mass.

Filed Jan. 12, 1981, Ser. No. 224,100
Int. Cl.³ C12Q *1/00*
U.S. Cl. 435—4 14 Claims

1. A mutagenicity assay method comprising

exposing a population of a eukaryotic animal species to a suspected mutagen, said animal species being a species in which mutation can cause an increase or decrease in size and in which said mutation behaves as a single locus mutation, and

scoring the occurrence, in a subsequent generation, of animals of a size different from that of said exposed population as a measure of the mutagenicity of said suspected mutagen.

4,345,027

FLUOROMETRIC METHOD OF QUANTITATIVE CELL MUTAGENESIS

Frank A. Dolbeare, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 12, 1980, Ser. No. 215,767
Int. Cl.³ G01N *1/30*
U.S. Cl. 435—21 10 Claims

1. A method for assaying a cell culture for mutagenesis, comprising:

staining said culture with a histochemical stain, said stain staining only normal cells and not abnormal cells in said culture;

counterstaining said culture with a fluorescent stain, wherein said fluorescent stain transmits wavelengths in the wavelength region absorbed by said histochemical stain;

subjecting said counterstained culture to exciting light; and

detecting the fluorescence from said counterstained culture.

8. A method for assaying bladder cells for an alkaline phosphatase deficiency, comprising:

applying a solution of naphthol AS-BI phosphate with fast blue BBN to a cell culture of bladder cells;

counterstaining said cell culture with a solution of fluorescamine or chromomycin A3;

subjecting said counterstained cell culture to exciting light to produce fluorescence in cells deficient in alkaline phosphatase; and

detecting said fluorescence.

4,345,028

BACTERIA GROWING DEVICE

Robert L. Nelson, Minneapolis, and Michael W. Downing, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 5,149, Jan. 22, 1979, Pat. No. 4,252,904, which is a continuation-in-part of Ser. No. 808,459, Jun. 21, 1977, abandoned. This application Oct. 6, 1980, Ser. No. 193,933
Int. Cl.³ C12Q *1/24*
U.S. Cl. 435—30 7 Claims

1. A wand for picking up a predetermined quantity of bacteria from the surface of at least one growth colony of said bacteria consisting essentially of a rod-like member having a top end, and a lower colony-contacting tip, said lower tip having at least one groove in the lowermost end of said tip into which said bacteria are ingested, said groove being capable of

ingesting said predetermined quantity of bacteria by capillary action.

4,345,029

MYCOBACTERIUM PHLEI MUTANTS CONVERT STEROLS TO ANDROSTA-1,4-DIENE-3,17-DIONE AND ANDROSTA-4-ENE-3,17-DIONE

Merle G. Wovcha, and Candice B. Biggs, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 849,526, Nov. 9, 1977, Pat. No. 4,293,645, and a continuation-in-part of Ser. No. 662,563, Mar. 1, 1976, abandoned. This application Sep. 8, 1980, Ser. No. 184,698
Int. Cl.³ C12P *33/16*
U.S. Cl. 435—55 8 Claims

1. A process for preparing a mixture of androsta-1,4-diene-3,17-dione and androst-4-ene-3,17-dione which comprises cultivating *Mycobacterium phlei* NRRL B-8154 in an aqueous nutrient medium under aerobic conditions in the presence of a steroid containing from 2 to 10 carbon atoms, inclusive, in the 17-alkyl side chain and recovering androsta-1,4-diene-3,17-dione and androst-4-ene-3,17-dione.

8. A process for preparing a mixture of androsta-1,4-diene-3,17-dione and androst-4-ene-3,17-dione which consists of cultivating a mutant microorganism of *Mycobacterium phlei*, said mutant being characterized by its ability to selectively degrade steroids having 17-alkyl side chains of from 2 to 10 carbon atoms, inclusive, and accumulate androsta-1,4-diene-3,17-dione and androst-4-ene-3,17-dione in the fermentation beer, in an aqueous nutrient medium under aerobic conditions in the presence of a steroid containing from 2 to 10 carbon atoms, inclusive, in the 17-alkyl side chain and recovering androsta-1,4-diene-3,17-dione and androst-4-ene-3,17-dione.

4,345,030

MICROORGANISM MUTANT CONVERSION OF STEROLS TO ANDROSTA-4-ENE-3,17-DIONE

Merle G. Wovcha, and Candice B. Biggs, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 849,525, Nov. 9, 1977, Pat. No. 4,293,644, which is a continuation-in-part of Ser. No. 735,075, Oct. 22, 1976, abandoned. This application Sep. 8, 1980, Ser. No. 184,722
Int. Cl.³ C12P *33/16*
U.S. Cl. 435—55 4 Claims

1. A process for preparing androst-4-ene-3,17-dione which consist of cultivating a mutant microorganism selected from the group consisting of Arthrobacter, Bacillus, Brevibacterium, Corynebacterium, Microbacterium, Nocardia, Protaminobacter, Serratia, and Streptomyces, said mutant being char-

acterized by its ability to selectively degrade steroids having 17-alkyl side chains of from 2 to 10 carbon atoms, inclusive, and accumulate androst-4-ene-3,17-dione in the fermentation beer, in an aqueous nutrient medium under aerobic conditions in the presence of a steroid containing from 2 to 10 carbon atoms, inclusive in the 17-alkyl side chain and recovering androst-4-ene-3,17-dione.

4,345,031

PROCESS FOR THE MANUFACTURE OF ALDONIC ACIDS BY AN ENZYMATIC METHOD

Guillaume Coppens, Brussels, Belgium, assignor to Solvay & Cie., Brussels, Belgium

Filed Jan. 15, 1980, Ser. No. 112,348

Claims priority, application France, Jan. 22, 1979, 79 01861

Int. Cl.³ C12P *7/58*

U.S. Cl. 435—137 **5 Claims**

1. A process for the manufacture of gluconic acid from glucose, comprising enzymatically oxidizing the glucose in the presence of glucose oxidase, in a reaction mixture containing water as a solvent, and containing dissolved oxygen in a concentration of between 40 and 10,000 mg/liter, wherein the oxidation is carried out at a temperature of between 0° and 60° C. and at a pH of between 4.2 and 8, and wherein the molar ratio of dissolved oxygen to glucose in the reaction mixture is kept above 0.1 by application of a gas containing oxygen under an oxygen partial pressure of between 1 and 100 bar.

4,345,032

CULTIVATION OF A DEODORIZING LACTOBACILLUS STRAIN, STORAGE THEREOF, AND COMPOSITION CONTAINING LIVING CELLS THEREOF

Kosei Hata, Osaka, Japan, assignor to Seikenkai, Osaka, Japan

Filed May 23, 1977, Ser. No. 799,320

Int. Cl.³ C12N *1/20, 1/04;* C12R *1/225;* A61K *37/00*

U.S. Cl. 435—253 **13 Claims**

1. A deodorizing composition comprising (1) the living cells of a Lactobacillus strain whose growth in enabled or promoted in a culture medium comprising at least one medium selected from the group consisting of S-W medium, S-W medium containing vitamins and S-W medium containing casamino acid, said S-W medium being composed of 1 g of KH_2PO_4, 0.7 g of $MgSO_4.7H_2O$, 1 g of NaCl, 4 g of $(NH_4)_2HPO_4$, 0.03 g of $FeSO_4.7H_2O$, and 5 g of glucose per 1 liter of water, said culture medium further containing at least one substance selected from the group consisting of hydrogen sulphide, sodium sulphide, ammonia, a lower fatty acid and a sulfur-containing amino acid, and (2) a coating substance comprising sulphur-containing amino acids coated on said cells, said cells having been recovered from a culture medium and then coated with said coating substance, said coating substance being present in an amount sufficient to maintain the deodorizing activity of said cells.

4,345,033

MYCOBACTERIUM FORTUITUM MUTANT

Merle G. Wovcha; Candice B. Biggs, both of Kalamazoo, and Thomas R. Pyke, Portage, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 849,525, Nov. 9, 1977, Pat. No. 4,239,644, and a continuation-in-part of Ser. No. 735,075, Oct. 22, 1976, abandoned. This application Sep. 8, 1980, Ser. No. 184,723

Int. Cl.³ C12N *1/20*

U.S. Cl. 435—253 **1 Claim**

1. A biologically pure culture of mutant *Mycobacterium fortuitum* NRRL B-11045.

4,345,034

MYCOBACTERIUM FORTUITUM MUTANT

Merle G. Wovcha, and Kevin E. Brooks, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 931,741, Aug. 7, 1978, Pat. No. 4,293,646. This application Aug. 8, 1980, Ser. No. 184,724

Int. Cl.³ C12P *33/16;* C12N *1/20*

U.S. Cl. 435—253 **1 Claim**

1. A biologically pure culture of mutant *Mycobacterium fortuitum* NRRL B-11359.

4,345,035

METHOD OF PRODUCING MOLTEN STONE MATERIAL IN A CUPOLA FURNACE

Leif Jensen, Olstykke, Denmark, assignor to Rockwool International A/S, Hovedgaden, Denmark

Filed Feb. 4, 1981, Ser. No. 232,780

Claims priority, application Denmark, Feb. 14, 1980, 631/80

Int. Cl.³ C03C *13/00*

U.S. Cl. 501—29 **3 Claims**

1. A method for producing a melt from briquettes of rocks, slags and/or other silicate materials and minerals, which comprises charging to a cupola furnace a mixture of or alternating layers of coke and said briquettes; characterized in that combustion air is supplied to a melting zone of the cupola furnace at a flow rate corresponding to at least 60 Nm^3/m^2 and that said briquettes have a uniform size, and a prismatic shape with a height not less than twice the average width.

4,345,036

OPTICAL GLASS FIBRES AND METHOD OF FORMING SUCH FIBRES

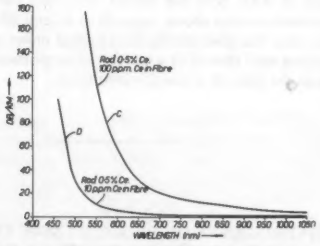
Charles R. Bamford, Southport; James R. Mellor, Ormskirk, and Bernard Parker, Billinge Nr. Wigan, all of England, assignors to Pilkington Brothers Limited, Merseyside, England

Filed Jan. 16, 1981, Ser. No. 225,818

Claims priority, application United Kingdom, Jan. 28, 1980, 8002834

Int. Cl.³ C03B *37/075;* C03C *1/10, 3/02, 3/04*

U.S. Cl. 501—37 **12 Claims**



1. A method of forming an optical fibre from a high-silica glass which contains at least 85 mol % SiO_2 and which is susceptible to the production of colour centres on drawing into fibres, wherein attenuation due to such drawing-induced colour centres is suppressed or reduced by incorporating from 1 to 100 parts per million of cerium oxide in the glass from which the fibre is drawn, under oxidising conditions such that a significant proportion of the cerium in the glass of the fibre is in the form of ceric ions and the fibre has a total attenuation of not more than 20 dB/Km in the wavelength range from 800 to 900 nm.

11. An optical glass fibre drawn from a glass containing at least 85 mol % silica and from 1 to 50 parts per million by weight of ceric ions, the attenuation characteristics of the fibre being such that the curve of attenuation plotted against wavelength shows no peaks due to drawing-induced colour centres

and the attenuation in the wavelength range from 800 to 900 nm is not more than 20 dB/Km.

4,345,037

ALKALI RESISTANT GLASS FIBRES FOR CEMENT REINFORCEMENT

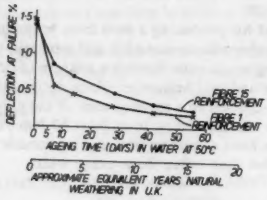
Kenneth M. Fyles, and Peter Shorrock, both of Wigan, England, assignors to Pilkington Brothers Limited, St. Helens, England

Filed Feb. 26, 1981, Ser. No. 238,515

Claims priority, application United Kingdom, Feb. 27, 1980, 8006653

Int. Cl.³ C03C *13/00*

U.S. Cl. 501—38 **15 Claims**


DEFLECTION AT FAILURE %
1·5
1·0
0·5
0 5 10 20 30 40 50 60
AGEING TIME (DAYS) IN WATER AT 50°C
FIBRE 15 REINFORCEMENT
FIBRE 1 REINFORCEMENT
0 5 10 15 20
APPROXIMATE EQUIVALENT YEARS NATURAL WEATHERING IN U.K.

1. Alkali-resistant glass fibres for use as reinforcement in cementitious products, formed from a composition comprising, in weight percentages:

SiO_2	55 to 75%
R_2O	11 to 23%
ZrO_2	6 to 22%
Cr_2O_3	0.1 to 1%
Al_2O_3	0.1 to 7%
Rare earth oxides + TiO_2	0.5 to 16%

where R_2O is any one or more of Na_2O, K_2O or Li_2O, the content of TiO_2 does not exceed 10%, and the total of the components recited above amounts to at least 88% by weight of the glass, the glass having been melted under non-oxidising conditions such that all or a substantial proportion of the chromium in the glass is in the trivalent state.

4,345,038

CO HYDROGENATION PROCESS USING STEAM AND MOLYBDENUM OXYCARBONITRIDE CATALYST

Larry E. McCandlish, Highland Park; Franklin J. Wright, Watchung, and Edwin L. Kugler, Summit, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 216,139, Dec. 15, 1980, abandoned. This application Sep. 23, 1981, Ser. No. 304,980

Int. Cl.³ C07C *1/10*

U.S. Cl. 518—711 **8 Claims**

1. A process for preparing paraffinic hydrocarbons including linear and branched C_1–C_{10} carbon chain number comprising contacting a gaseous mixture of CO and steam in a CO/steam volume ratio of 10:1 to 1:10, respectively, with a catalyst comprised of molybdenum oxycarbonitride, at a temperature in the range of about 100° to 600° C., a pressure of about 0.1 to 100 MPa, and a space velocity of about 100 to 50,000 v/v/hr., and recovering product paraffinic hydrocarbons.

4,345,039

METHOD OF RECOVERING POLYESTER FIBERS AND CELLULOSIC POWDER FROM POLYESTER/COTTON TEXTILE WASTE

Jack C. Cowan, Lafayette, La., and Tommy Thrash, Littlefield, Tex., assignors to Venture Chemicals, Inc., Lafayette, La.

Filed Jun. 1, 1981, Ser. No. 269,492

Int. Cl.³ C08J *11/00, 11/04*

U.S. Cl. 521—48 **10 Claims**

1. A method for recovering polyester fibers and cellulosic material in useful form from textile wastes containing blended polyester/cellulosic fibers comprising treating the textile waste with from about 0.3% to about 3% by weight of the cellulosic material in the waste of anhydrous hydrochloric acid gas at a temperature in the range from about ambient to about 180° F. for a period from about 5 minutes to about 48 hours, mechanically degrading the reacted cellulosic material to a fine powder, and separating the polyester fibers from the reacted cellulosic material, wherein said cellulosic material is selected from the group consisting of cotton and rayon.

4,345,040

STABILIZATION OF POST-CHLORINATED VINYL CHLORIDE POLYMERS BY PHOSPHATE SALTS

Dale R. Hall, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jun. 16, 1980, Ser. No. 159,532

Int. Cl.³ C08J *9/40*

U.S. Cl. 521—53 **15 Claims**

1. A process for producing post-chlorinated polymers having increased thermal stability during processing which comprises forming an aqueous solution containing a metal salt of phosphoric acid, contacting a porous post-chlorinated vinyl chloride polymer with said solution while agitating the mixture said polymer containing from about 64% to about 70% by weight of chlorine and from about 5% to about 65% by volume of pore space, evaporating the liquid from said mixture, and drying and recovering said so-treated resin.

4,345,041

FOAMING SYNTHETIC RESIN COMPOSITIONS STABILIZED WITH N-(HIGHER ALKYL) C_1–C_8 AMIDES

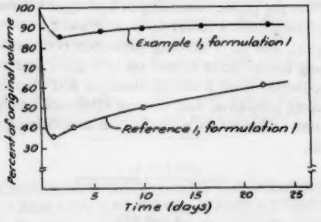
Tsuneo Hoki, and Yutaka Matsuki, both of Suzuka, Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Mar. 6, 1981, Ser. No. 241,271

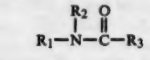
Claims priority, application Japan, Mar. 10, 1980, 55-29099

Int. Cl.³ C08J *9/14*

U.S. Cl. 521—94 **6 Claims**



1. A foamable synthetic resin composition comprising a normally solid olefin polymer, a volatile organic blowing agent and from 0.1 to 10 percent by weight, based on said olefin polymer of at least one compound of formula I:



(I)

wherein R_1 is an aliphatic hydrocarbon group having 10 to 24

carbon atoms; R_2 is a hydrogen atom, an aliphatic hydrocarbon group having 1 to 24 carbon atoms, or oxyalkylene or polyoxyalkylene group represented by $—R_4—O—_nA$ wherein R_4 is a residual group of an aliphatic polyhydric alcohol having 1 to 5 carbon atoms, A is a hydrogen atom or a residual group of an aliphatic carboxylic acid having 1 to 24 carbon atoms and n is an integer ranging from 1 to 20; and R_3 is a hydrogen atom or an aliphatic hydrocarbon group having 1 to 7 carbon atoms.

4,345,042

POLYURETHANE-MODIFIED POLYISOCYANURATE FOAM AND METHOD FOR PRODUCING THE SAME

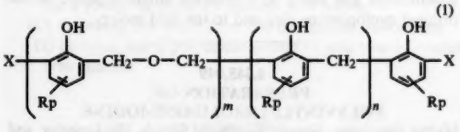
Akira Kuroda, Funabashi; Tsutomu Nakamura, Shiraokamachi, and Masatoshi Onishi, Yokohama, all of Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 6, 1981, Ser. No. 241,439
Claims priority, application Japan, Mar. 21, 1980, 55-34694
Int. Cl.³ C08G *18/14*
U.S. Cl. 521—112 **14 Claims**

1. A polyurethane-modified polyisocyanurate foam comprising a reaction product of a mixture containing

(A) a polyisocyanate component consisting of at least one polyisocyanate compound;

(B) a polyol component containing at least one benzylic ether type phenolic resin of the formula (1):



(1)

wherein R represents a member selected from the group consisting of a hydrogen atom, hydrocarbon radicals, oxyhydrocarbon radicals and halogen atoms; X represents a terminal group selected from the group consisting of a hydrogen atom and methylol radical, the molar ratio of the methylol terminal group to the hydrogen terminal group being at least 1; and m and n represent an integer, respectively, the sum of m and n being at least 2 and the ratio of m to n being at least 1, and p represents an integer from 1 to 3;

(C) a catalyst for trimerizing said polyisocyanate compound, and;

(D) a blowing agent, the ratio of the amount of isocyanate equivalent of said polyisocyanate component to the amount of hydroxyl equivalent of said polyol component, being in the range of from 1.5 to 10.

4,345,043

VINYL CHLORIDE RESIN COMPOSITION

Haruhiko Yusa; Masanori Oota, and Haruki Isaka, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 3, 1980, Ser. No. 183,833
Claims priority, application Japan, Sep. 3, 1979, 54-112601
Int. Cl.³ C08K *9/00*
U.S. Cl. 523—209 **6 Claims**

1. A vinyl chloride resin composition comprising a vinyl chloride resin and modified titanium oxide and having a titanium oxide content of 0.1 to 30% by weight based on the total amount of said vinyl chloride resin and said modified titanium oxide, said modified titanium oxide having a particle size of about 1 to 200μ and having been obtained by suspension copolymerizing a monomer mixture of vinyl chloride and 10-undecenoic acid in the presence of titanium oxide, said modified titanium oxide comprising 30 to 2,000 parts by weight of the resulting copolymer with respect to 100 parts by weight of titanium oxide, said copolymer in said modified titanium oxide comprising 0.1 to 70% by weight of polymerized units of said 10-undecenoic acid based on the weight of said copolymer.

4,345,044

ACRYLIC WOOD FILLER

Peter S. Columbus, Whitestone, and John Anderson, Brooklyn, both of N.Y., assignors to Borden, Inc., N.J.

Continuation-in-part of Ser. No. 819,466, Jul. 27, 1977, abandoned. This application Nov. 24, 1980, Ser. No. 209,502
Int. Cl.³ C08K *3/34, 3/26*
U.S. Cl. 523—220 **18 Claims**

1. Wood filler composition which provides exceptional performance on soft and hard species of wood, which is easily spreadable, resists shrinking on drying and cracking, stains superbly, is highly water resistant, can be sanded easily and which has excellent adhesion to wood, metal and paint, said composition having a viscosity of 120,000 to 250,000 cps. and comprising on solids basis 6 to 14% acrylic resin comprising polymerized acrylate esters, 3 to 10% platy talc having an average particle size of about 9 microns, 3 to 12% clay filler having an average particle size of about 5 microns, 3 to 10% barytes filler, 40 to 65% calcium carbonate filler and 13 to 35% water.

4,345,045

RESIN STABILIZER SYSTEMS OF ORGANOTIN SULFUR-CONTAINING COMPOUNDS AND ORGANIC OVER-BASED COMPLEXES

Thomas C. Jennings, Lyndhurst, and Charles W. Fletcher, Jr., Highland Heights, both of Ohio, assignors to Dart Industries, Inc., Northbrook, Ill.

Division of Ser. No. 353,910, Apr. 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 116,671, Feb. 18, 1971, Pat. No. 3,764,571. This application Nov. 29, 1979, Ser. No. 98,596
Int. Cl.³ C08K *5/58*
U.S. Cl. 524—180 **36 Claims**

6. A vinyl halide resin composition which comprises a vinyl halide resin and, as a heat stabilizer, an effective amount of a composition consisting essentially of,

an organotin sulfur-containing compound having a

group, and

a metal compound selected from the group consisting of an organic over-based complex of an alkali and an alkaline earth metal base, and mixtures of said metal compounds, said organotin and metal compound components in relative amounts which together provide a synergistic stabilizing effectiveness upon said resin.

4,345,046

CALENDERING OF POLYOLEFINS

Adam J. Ejk, Piscataway, and Donald J. Krzywicki, Hopewell, both of N.J., assignors to Tenneco Chemicals, Inc., Piscataway, N.J.

Filed Jun. 5, 1981, Ser. No. 270,757
Int. Cl.³ C08J *3/18;* C08K *5/09, 5/20*
U.S. Cl. 524—223 **30 Claims**

1. A lubricant composition for polyolefins which comprises from about 60 to about 70 parts by weight of at least one N,N'-ethylenebis amide of a fatty acid or hydroxy-substituted fatty acid having from about 10 to about 22 carbon atoms, from about 22 to about 32 parts by weight of at least one free fatty acid or hydroxy-substituted fatty acid having from about 10 to about 22 carbon atoms, and from about 3 to about 13 parts by weight of a least one metal salt of at least one fatty acid or

hydroxy-substituted fatty acid having from about 10 to about 22 carbon atoms.

8. In a polyolefin composition comprising an intimate mixture of at least one polyolefin resin and a lubricant, the amount of said lubricant being from about 0.1 parts by weight to about 5 parts by weight per 100 parts by weight of said polyolefin resin, the improvement wherein said lubricant comprises:

(a) from about 60 to about 70 parts by weight of at least one N,N'-ethylenebis amide of a fatty acid or hydroxy-substituted fatty acid having from about 10 to about 22 carbon atoms,

(b) from about 22 to about 32 parts by weight of at least one free fatty acid or hydroxy-substituted fatty acid having from about 10 to about 22 carbon atoms, and

(c) from about 3 to about 13 parts by weight of at least one metal salt of at least one fatty acid or hydroxy-substituted fatty acid having from about 10 to about 22 carbon atoms.

4,345,047

ADHESIVE COMPOSITION

John Walter, Evergreen Park, Ill., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Dec. 18, 1980, Ser. No. 217,616

Int. Cl.³ C08L *63/00*

U.S. Cl. 525—108 **5 Claims**

1. An adhesive composition comprising a volatile organic solvent having dispersed therein about 10 to about 70% by weight of a thermoplastic vinyl chloride polymer resin and about 5 to about 30% by weight of a thermosetting epoxy resin normally incompatible with the vinyl chloride polymer resin and an amount of about 20 to about 85 percent by weight of an acrylonitrile/butadiene/styrene copolymer which amount of copolymer is capable of imparting compatibility between the epoxy resin and the vinyl chloride polymer, the copolymer containing about 10 to about 30% by weight acrylonitrile, about 10 to 30% by weight butadiene and about 40 to about 70 percent by weight styrene.

4,345,048

BROMINATED CYCLOALIPHATIC (METH) ACRYLATE COMPOSITIONS

Hans R. Friedli, Lake Jackson, and Clinton J. Boriack, Freeport, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 21, 1980, Ser. No. 113,914

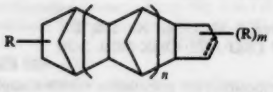
Int. Cl.³ C08F *8/00*

U.S. Cl. 525—192 **3 Claims**

1. A brominated cycloaliphatic (meth) acrylate composition which comprises the reaction product of bromine with a cycloaliphatic (meth) acrylate composition wherein the reaction takes place at a temperature in the range from −30° to 50° C. in the presence of an inert solvent wherein the mol ratio of bromine per mol of cycloaliphatic unsaturation is in the range from 1:1 to 1.1:1 and wherein said composition has

(A) about 60 to 95 percent by weight of dicyclopentadienyl acrylate, dicyclopentadienyl methacrylate, or mixtures thereof,

(B) about 2 to 15 percent by weight of a mixture of polycyclopentenyl acrylates of the formula



where

R is CH_2=C(Z)—C(O)—O—

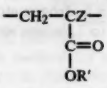
Z is H, or methyl

n is 1, or 2

m is 0 or 1 and when m is 0 there is a double bond present in the cyclopentyl group,

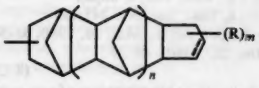
(C) about 0.5 to about 21 percent by weight of a mixture of the copolymers of methacrylic acid or acrylic acid with adducts of cyclopentadiene with isoprene, piperylene methylcyclopentadiene, or mixtures thereof,

(D) about 0.05 to 10 weight percent of a mixture of polyacrylates having the repeating unit:



where

R' is hydrogen or



R is CH_2=CZ—C(O)—O—, Z is hydrogen or methyl, n is 0, 1 or 2. and m is 0 or 1, and when m is 0, there is a double bond present in the cyclopentyl group,

wherein said reaction product has substantially all the original acrylic unsaturation, substantially no remaining cycloolefinic unsaturation and has 1 to 4 bromine atoms attached to the original cyclopentene ring and to the acid moiety.

4,345,049

PREPARATION OF POLYVINYLPYRROLIDONE-IODINE

Walter Denzinger, Speyer; Ferdinand Straub, Hockenheim, and Heinrich Hartmann, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 3, 1980, Ser. No. 193,462

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1979, 2941387

Int. Cl.³ C08F *8/04*

U.S. Cl. 525—339 **9 Claims**

1. A process for the preparation of polyvinylpyrrolidone-iodine which comprises subjecting a polyvinylpyrrolidone having a K value of from 10 to 50 to a hydrogenation treatment and thereafter reacting the resultant polyvinylpyrrolidone with iodine.

4,345,050

BLOCK COPOLYMERS OF POLYPHENYLENE OXIDES AND POLYFORMALS ON NON-STERICALLY-HINDERED DIHYDRIC PHENOLS

George R. Loucks, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 2, 1981, Ser. No. 239,722

Int. Cl.³ C08G *81/00, 65/40*

U.S. Cl. 525—390 **5 Claims**

1. A block copolymer of polyphenylene oxide and polyformals of a non-sterically-hindered dihydric phenol.

4,345,051

BLOCK COPOLYMERS OF POLYPHENYLENE OXIDES AND POLYFORMALS OF STERICALLY-HINDERED DIHYDRIC PHENOLS

George R. Loucks, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 2, 1981, Ser. No. 239,723

Int. Cl.³ C08G *81/00, 65/40*

U.S. Cl. 525—390 **5 Claims**

1. A block copolymer of a polyphenylene oxide and a polyformal of a sterically-hindered dihydric phenol.

4,345,052

METHOD FOR THE PREPARATION OF POLYETHER ESTER AMIDES

Salih Mumcu, Marl, and Hans J. Panoch, Haltern, both of Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Filed Jul. 10, 1980, Ser. No. 169,111

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1979, 2932234

Int. Cl.³ C08L 77/02, 77/12

U.S. Cl. 525—411 10 Claims

1. A method for preparing polyether ester amides, comprising:

(A) preparing a mixture of polyamides and polyethers selected from the group consisting of

(a) polyamides having carboxyl end groups and polyethers having hydroxyl end groups and amino end groups;

(b) polyamides having carboxyl end groups and polyethers having hydroxyl end groups;

(c) polyamides having carboxyl end groups and polyethers having amino end groups; and

(d) polyamides having amino end groups and polyethers having carboxyl end groups;

(B) treating the mixture of (A) as a hot melt at a temperature between about 200° to 300° C. and under a water vapor pressure of about 5 to 25 bars with mechanical agitation for a period of about 15 minutes to 4 hours;

(C) removing the water from (B) by decompression; and

(D) carrying out a polycondensation of said treated, water free mixture.

4,345,053

SILICON-TERMINATED POLYURETHANE POLYMER

Sidky D. Rizk, Westfield; Harry W. S. Hsieh, Rahway, and John J. Prendergast, Freehold, all of N.J., assignors to Essex Chemical Corp., Clifton, N.J.

Filed Jul. 17, 1981, Ser. No. 284,195

Int. Cl.³ C08L 27/00

U.S. Cl. 525—440 25 Claims

1. The method of making a moisture-curable silicon terminated polymer which comprises reacting a polyurethane prepolymer having terminal active hydrogen atoms with an isocyanato organosilane having a terminal isocyanate group and at least one hydrolyzable alkoxy group bonded to silicon.

4. A method as in claim 1 wherein said isocyanato organosilane having at least one hydrolyzable alkoxy group bonded to silicon is gamma-isocyanatopropyl triethoxysilane.

5. A moisture-curable silicon terminated organic polymer made by the method of claim 4.

4,345,054

HIGH-MOLECULAR-WEIGHT NOVOLAK TYPES SUBSTITUTED PHENOLIC RESINS AND PROCESS FOR PREPARATION THEREOF

Nobuyuki Takeda, and Tadao Iwata, both of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

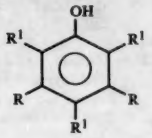
Filed Dec. 29, 1980, Ser. No. 221,333

Claims priority, application Japan, Dec. 27, 1979, 54-169140; Jun. 3, 1980, 55-73754; Jun. 3, 1980, 55-73755; Jun. 3, 1980, 55-73756; Jun. 3, 1980, 55-73757

Int. Cl.³ C08L 61/14

U.S. Cl. 525—480 56 Claims

1. A process for the preparation of high-molecular-weight novolak type substituted phenolic resins, which comprises reacting (A) a novolak type substituted phenolic resin composed of a phenol comprising 70 to 100 mole % of at least one bifunctional phenol represented by the following general formula (I):



(I)

wherein two of three R^1's are hydrogen atoms and the remaining one R^1 is an alkyl group having 1 to 8 carbon atoms, an aryl group having 6 to 10 carbon atoms, a halogen atom or a hydroxyl group, and two R's, which may be same or different, stand for a member selected from the group consisting of a hydrogen atom, an alkyl group having 1 to 8 carbon atoms, a halogen atom and a hydroxyl group,

and 0 to 30 mole % of a trifunctional phenol and an aldehyde represented by the following general formula:

$$R^2—CHO \qquad (II)$$

wherein R^2 stands for a hydrogen atom or a substituent selected from the group consisting of a methyl group and a halogenated methyl group,

and having an hydroxyaryl unit at the molecule terminal and a number average molecular weight of from 250 to 1200, with (B) at least one dimethylolated product of said bifunctional and/or trifunctional phenol as a chain extender, in the presence of an acid catalyst, so that at least 70 mole % of the phenol component in the final novolak type substituted phenolic resin is occupied by said bifunctional phenol, until the number average molecular weight of the final novolak type substituted phenolic resin is at least 1500 as measured by vapor pressure osmometry in N,N-dimethylacetamide as the solvent, the ratio of the two reactants being such that the amount of the methylol group of the dimethylolated phenol is 0.5 to 1.5 equivalents per equivalent of the terminal hydroxyaryl unit of the starting novolak type substituted phenolic resin (A).

4,345,055

POLYMERIZATION WITH TITANIUM IMPREGNATED SILICA-CHROMIUM CATALYSTS

Gil R. Hawley, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 118,838, Feb. 6, 1980, Pat. No. 4,296,001. This application May 20, 1981, Ser. No. 265,477

Int. Cl.³ C08F 4/02, 4/24

U.S. Cl. 526—96 40 Claims

1. A polymerization process comprising contacting at least one mono-1-olefin having 2 to 8 carbon atoms per molecule with a chromium-containing catalyst produced by impregnating a dry silica xerogel, formed by drying a silica hydrogel, with an aqueous solution of a water soluble hydrolysis resistant titanium compound.

26. A polymerization process comprising contacting at least one mono-1-olefin having 2 to 8 carbon atoms with a chromium-containing catalyst produced by forming a silica hydrogel containing a water soluble hydrolysis resistant titanium compound, and drying said hydrogel to form a xerogel, wherein said hydrogel contains in addition a pore preserving agent selected from organic silicon compounds, oxygen-containing organic compounds, acids, and surfactants.

4,345,056

PROCESS FOR SUSPENSION POLYMERIZATION OF VINYL CHLORIDE EMPLOYING MIXED PROTECTIVE COLLOIDS

Helmut E. Thyret; Thomas Balwe; Gerhard Beier, and Johann Bauer, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 803,655, Jun. 6, 1976, abandoned. This application Nov. 13, 1978, Ser. No. 959,796

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1976, 2629880

Int. Cl.³ C08F *2/20*

U.S. Cl. 526—200 **2 Claims**

1. In the process for the production of polyvinyl chloride comprising the steps of heating an aqueous suspension of monomers selected from the group consisting of vinyl chloride and mixtures of vinyl chloride with up to 20% by weight of monomers copolymerizable with vinyl chloride under suspension polymerization conditions in the presence of from 0.01% to 0.3% by weight, based on the weight of monomers, of at least one monomer-soluble free-radical polymerization catalyst, and from 0.05% to 0.5% by weight, based on the weight of the monomers, of at least two protective colloids, at a pH of from 3 to 8 and the autogenous vinyl chloride pressure, to a temperature of from 30° C. to 70° C. for a time sufficient to effect polymerization and recovering said polyvinyl chloride having a K-value of from 40 to 80, the improvement consisting of utilizing a mixture of a first component of from 20% to 80% of the weight of said mixture of a polyvinyl acetate having a hydrolysis degree of 40 to 50 mol % and a viscosity, measured in a 4% solution of a 1:1 mixture of isopropanol and water at 20° C. by the Höppler falling-ball viscosimeter, of from 5 to 15 mPas, and the remainder of said mixture being a second component of protective colloid being an aminoethyl-hydroxypropyl cellulose having a molar substitution of from 0.05 to 1.5 mols of aminoethyl groups and from 3 to 4 mols of hydroxypropyl groups and a viscosity, measured in a 2% aqueous solution at 20° C. and a pH of 5, of from 50 to 500 mPas, as said at least two protective colloids, whereby said polyvinyl chloride has a low tendency to form specks and a high plasticizer absorption capacity.

4,345,057

CURABLE FLUOROCOPOLYMER

Masaaki Yamabe; Gen Kojima, both of Machida, and Seitoku Kaya, Yokohama, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Jul. 14, 1981, Ser. No. 283,239

Claims priority, application Japan, Aug. 8, 1980, 55-108189

Int. Cl.³ C08F *214/18*

U.S. Cl. 526—247 **5 Claims**

1. A curable fluorocopolymer which comprises 40 to 60 mol % of fluoroolefin units, 5 to 45 mol % of cyclohexyl vinyl ether units, 5 to 45 mol % of alkyl vinyl ether units and 3 to 15 mol % of hydroxyalkyl vinyl ether units and has an inherent viscosity of 0.05 to 2.0 dl/g. in tetrahydrofuran at 30° C.

4,345,058

URETHANE PREPOLYMER REPAIR SYSTEM

Theodore J. Dettling, 574 Castle Blvd., Akron, Ohio 44313

Filed Jul. 29, 1981, Ser. No. 286,641

Int. Cl.³ C08G *18/48*

U.S. Cl. 528—48 **13 Claims**

1. A urethane prepolymer repair system which comprises:

a urethane prepolymer composition capable of curing to an elastomer upon exposure to atmospheric moisture and having:

a total solids of 60–100%,

a cured Durometer hardness of 50–90 Shore A,

a cured 100% modulus of at least 200 psi, and

a shelf life of at least 30 days at 120° F.;

said urethane prepolymer composition containing a urethane prepolymer made essentially from a polytetramethylene ether glycol or mixture of glycols having a hydroxyl equivalent weight of about 300 to 2,000, and a stoichiometric excess of an organic polyisocyanate;

said polytetramethylene ether glycol urethane prepolymer having:

an isocyanate content of about 0.8–2.4%, and

an average molecular weight of about 3,500–10,500;

said urethane prepolymer composition being packaged in and dispensed from a moisture-impermeable container having a closable dispensing orifice and means to reduce the volume of the container and thereby extrude the urethane prepolymer composition through the orifice without introducing ambient air into the container.

4,345,059

FIRE RETARDANT EPOXY RESINS CONTAINING 3-HYDROXYALKYLPHOSPHINE OXIDES

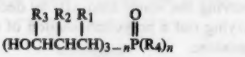
Edward R. Fretz, Jr., East Windsor, and Joseph Green, East Brunswick, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed May 18, 1981, Ser. No. 264,256

Int. Cl.³ C08G *59/30, 59/62*

U.S. Cl. 528—102 **14 Claims**

1. A fire retardant epoxy resin containing an effective amount of a 3-hydroxypropylphosphine oxide having the general formula:



wherein R_1 may be the same or a different radical selected from the group consisting of hydrogen, phenyl, hydroxymethyl and alkyl radicals of 1–4 carbon atoms, R_2 may be the same or a different radical selected from the group consisting of hydrogen, hydroxymethyl, and alkyl radicals of 1–4 carbon atoms, R_3 may be the same or a different radical selected from the group consisting of hydrogen and methyl radicals, R_4 is an alkyl radical of 2–8 carbon atoms and n is either 1 or 2.

4,345,060

DIGLYCIDYL ETHERS OF DIPHENYLOL ALKANES, THEIR PREPARATION AND USE IN CURABLE COMPOSITIONS

John Ramsbotham, and Johan van Gogh, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

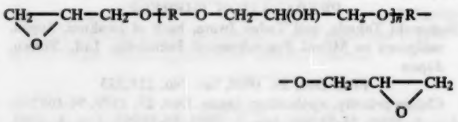
Filed Jun. 15, 1981, Ser. No. 273,704

Claims priority, application United Kingdom, Jul. 8, 1980, 8022299

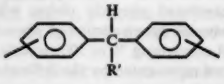
Int. Cl.³ C08G *59/22*

U.S. Cl. 528—103 **5 Claims**

1. A diglycidyl ether of isomeric diphenylol alkanes having the formula:



wherein n is a number of from about 0 to about 4, R is the group:



and R' is n-hexyl, the weight ratio of para,para'-isomer to ortho,para'-isomer being from 80:20 to 40:60.

4,345,061

PROCESS FOR THE PREPARATION OF PHENOL-UREA-FORMALDEHYDE CONDENSATION PRODUCTS

Walter Hasselman, Jr., Scarsdale, N.Y., assignor to C.P. Chemical Co., Inc., White Plains, N.Y.

Division of Ser. No. 973,683, Dec. 27, 1978, which is a continuation of Ser. No. 497,738, Aug. 15, 1974, abandoned. This application Dec. 15, 1980, Ser. No. 216,678

Int. Cl.³ C08G *14/08*

U.S. Cl. 528—161 **2 Claims**

1. Process for the preparation of phenol-urea-formaldehyde condensation products utilized in the manufacture of rigid cellular insulating foams which comprises:

(a) reacting phenol with a stoichiometric excess of neutralized formaldehyde in aqueous solution;

(b) reacting urea with the neutralized mixture obtained in (a) and formic acid in amounts such that a condensation product containing from about 1 to about 20 percent by weight phenol and the remainder formaldehyde and urea in the molar ratio of about 1.5:1 to 4:1 is obtained;

(c) discontinuing the reaction in (b) when the condensation product has a viscosity in the range of from about 30 to 36 seconds on a No. 1 Zahn cup; and

(d) neutralizing the resultant condensation product to a pH in the range of about 6 to about 8.

4,345,062

POLYCARBONATE TRANSESTERIFICATION WITH TETRABORATE OR TETRAALUMINATE ANION CONTAINING CATALYST

Daniel J. Brunelle, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 106,855, Dec. 26, 1979, abandoned. This application May 11, 1981, Ser. No. 262,287

Int. Cl.³ C08G *63/62*

U.S. Cl. 528—198 **12 Claims**

1. In a process for preparing a high molecular weight polycarbonate by reacting at least one bis(aryl)carbonate with at least one dihydric phenol in the presence of a transesterification catalyst containing tetraborate or tetraaluminate anions, the improvement comprising carrying out the process in accordance with the following sequence and parameters:

(1) reacting at a temperature less than about 250° C.

(i) a borohydride of the general formula:

$$MBH_nR_{4-n}$$

or an aluminum hydride of the formula:

$$MAl_nHR_{4-n}$$

wherein M is selected from the class consisting of an alkali metal, an alkaline earth metal, a quaternary hydrocarbon ammonium, a quaternary hydrocarbon phosphonium and a tertiary hydrocarbon sulfonium group, n is a number of from 1 to 4, and R is a hydrocarbon or hydrocarbonoxy group,

(ii) with a phenol or a bis(aryl)carbonate to form a preformed catalyst of the general formulas:

$$MBH_xR_{4-x}$$

$$MAlH_xR_{4-x}$$

$$MB(OR'')_x(OR''')_{4-x} \text{ or}$$

$$MAl(OR'')_x(OR''')_{4-x}$$

wherein x is integer at least a whole number less than n, R''' is an aryl group, and R'' is an alkyl group, and

(2) adding and reacting at least one bis(aryl)carbonate and at least one dihydric phenol at elevated temperatures and reduced pressures to form high molecular weight aromatic polycarbonate.

4,345,063

GLYOXAL/CYCLIC UREA CONDENSATES

Bernard F. North, Rock Hill, S.C., assignor to Sun Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 207,248, Nov. 17, 1980, Pat. No. 4,284,758, which is a continuation-in-part of Ser. No. 92,630, Nov. 8, 1979, abandoned. This application May 15, 1981, Ser. No. 264,016

The portion of the term of this patent subsequent to Aug. 18, 1998, has been disclaimed.

Int. Cl.³ C08G *4/00*

U.S. Cl. 528—245 **3 Claims**

1. The alkylated product of the reaction of about 1.2–2.0 moles of glyoxal and about 1 mole of one or more cyclic ureas.

4,345,064

PREPARATION OF POLYETHER ESTER AMIDES

Salih Mumcu, Marl, Fed. Rep. of Germany, assignor to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Filed Aug. 25, 1980, Ser. No. 180,617

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1979, 2936977

Int. Cl.³ C08G *69/44, 63/42*

U.S. Cl. 528—288 **8 Claims**

1. A method for preparing polyether ester amides, comprising:

(a) preparing polyamides having carboxyl end groups by melting a mixture of lactams having at least 8 carbon atoms with dicarboxylic acids in a molar ratio of 100/1 to 100/15 in the presence of a polyamide catalyst and in an inert gas atmosphere at atmospheric pressure and in the absence of water, at temperatures from about 230° to 300° C., said melting continuing for sufficient time to react at least 98% of said lactams;

(b) mixing sufficient water and polyether with the reaction product of (a) to form said polyether ester amide;

(c) treating the mixture obtained in (b) at a temperature between about 200° to 300° C. and under the vapor pressure of said water added in (b) to about 5 to 25 bars pressure with mechanical agitation;

(d) removing said water from (c) by decompression; and

(e) polycondensing the product of (d) to form said polyether ester amide.

4,345,065

METHOD FOR POLYMERIZING PYRROLIDONE WITH PREHEATING OF CATALYST SOLUTION

Edmond H. J. P. Bour, Limbricht; Johannes A. L. Brouwers, Echt, and Jean M. M. Warnier, Urmond, all of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Apr. 8, 1980, Ser. No. 138,454

Claims priority, application Netherlands, Apr. 14, 1979, 7902966

Int. Cl.³ C08G *69/16, 69/24*

U.S. Cl. 528—312 **5 Claims**

1. In a method for polymerizing pyrrolidone monomer, or pyrrolidone mixed with up to 25 mole % of another copolymerizable lactam monomer, with at least one polymerization accelerator, and, as catalyst solution, an alkali metal pyrrolidonate dissolved in pyrrolidone solvent, to produce a solid pyrrolidone polymer,

the improvement wherein the catalyst solution is heated for at least 5 hours at a temperature between 100° C. and 175° C. in the absence of both oxygen and water prior to polymerization.

4,345,066

TRANSPARENT COPOLYAMIDES AND THEIR APPLICATION TO TRANSPARENT, IMPACT RESISTANT MOLDED ARTICLES

Jörn Rüter, Marl, Fed. Rep. of Germany, assignor to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Filed Aug. 26, 1980, Ser. No. 181,413

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936759

Int. Cl.³ C08G *69/02, 69/26*

U.S. Cl. 528—324 8 Claims

1. In a transparent, high molecular weight copolyamide having a high glass transition temperature, based on:

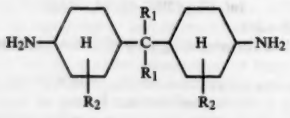
(1) a lactam or an omega-aminocarboxylic acid;

(2) terephthalic acid, isophthalic acid, or mixtures thereof; and

(3) a mixture of diamines; the improvement wherein said copolyamide consists essentially of the polymeric reaction product of

(A) about 25 to 60 mole % of at least one omegaaminocarboxylic acid having at least 11 C atoms in a continuous chain or its lactam;

(B) about 40 to 75 mole % of an equivalent mixture of terephthalic acid, isophthalic acid or a mixture thereof, and a diamine mixture of about 80 to 50 mole % referred to the total diamine mixture, of isophorone diamine and correspondingly about 20 to 50 mole % of diamines having the general formula



where R_1 and R_2 are hydrogen atoms or alkyl groups having 1 to 4 C atoms and the sum of A + B amounts to 100 mole %.

4,345,067

EMULSION POLYMER RECOVERY

Richard H. Wunder, Corunna, Canada, assignor to Polysar Limited, Sarnia, Canada

Filed Oct. 16, 1980, Ser. No. 197,627

Claims priority, application Canada, Nov. 26, 1979, 340590

Int. Cl.³ C08C *1/15*

U.S. Cl. 528—485 14 Claims

1. An improved process for the coagulation of a butadiene-styrene polymer prepared by aqueous emulsion free radical polymerization, the process being characterized in that the emulsion of said polymer is coagulated by mixing (i) with aqueous inorganic coagulant which is one of sulphuric acid or sulphuric acid plus sodium chloride, (ii) with an aqueous solution or suspension of an additive of polysaccharide material or a vegetable derived proteinaceous material and (iii) with a water soluble polyamine compound, the amount of said additive being from about 0.5 to about 2.5 parts by weight per 100 parts by weight of said polymer and the amount of said polyamine compound being from about 0.02 to about 0.2 parts by weight per 100 parts by weight of said polymer, the sulphuric acid being in sufficient quantity to maintain the pH during coagulation at below about 4.5.

4,345,068

PROCESS FOR THE PREPARATION OF 4'-EPIDAUNORUBICIN, 3',4'-DIEPIDAUNORUBICIN, THEIR DOXORUBICIN ANALOGS, AND INTERMEDIATES USED IN SAID PROCESS

Antonio Suarato; Sergio Penco, and Federico Arcamone, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

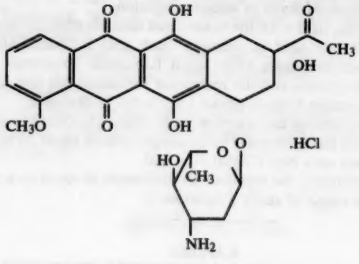
Filed Jun. 30, 1980, Ser. No. 164,088

Claims priority, application United Kingdom, Nov. 22, 1979, 7940457

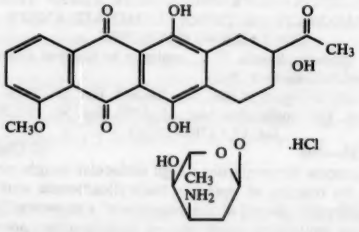
Int. Cl.³ C07H *15/24;* A61K *31/71*

U.S. Cl. 536—17 A 7 Claims

1. A process for preparing 4'-epi-daunorubicin.HCl (VII) and 3',4'-di-epidaunorubicin.HCl (VIII):

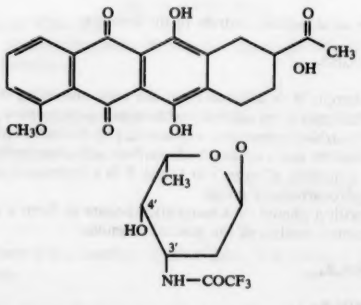


VII



VIII

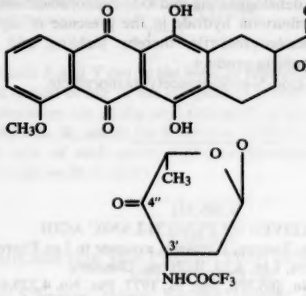
said process comprising subjecting N-trifluoroacetyl daunorubicin (I):



I

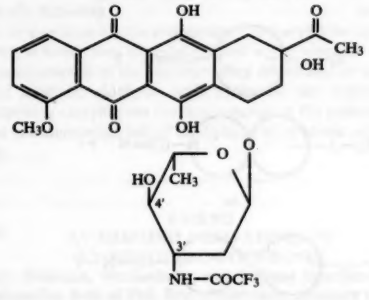
by treatment with dimethylsulfoxide activated by trifluoroacetic anhydride, to oxidation at the C-4' hydroxyl group at a temperature of about −65° to −60° C., followed by basification thereof with 1,5-diazobicyclo (4.3.0)-non-5-ene to form 4'-keto-N-trifluoroacetyl daunorubicin (III a):

IIIa



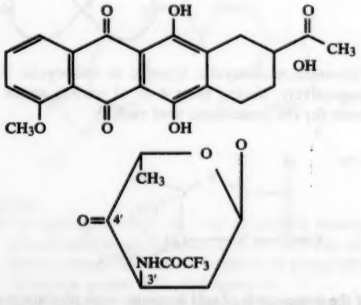
subjecting said 4'-keto-N-trifluoroacetyl daunorubicin (IIIa) to selective stereospecific reduction with sodium borohydride at a temperature of about −10° C. to obtain 4'-epi-N-trifluoroacetyl daunorubicin Va:

Va



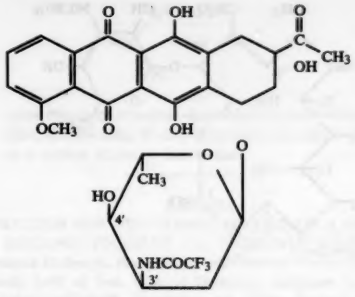
converting said 4'-epi-N-trifluoroacetyl daunorubicin (Va) to 4'-epi-daunorubicin base (VII) by treatment with a mild alkali to remove the N-trifluoroacetyl group and isolating said 4'-epi-daunorubicin as its hydrochloride or alternatively, subjecting said 4'-keto-N-trifluoroacetyl daunorubicin (IIIa) to epimerization by filtering a solution thereof through a column of silica gel buffered at pH 7 with M/15 phosphate buffer to give a 1:1 epimeric mixture of said (IIIa) and 3'-epi-4'-keto-N-trifluoroacetyl daunorubicin (IV a):

IVa



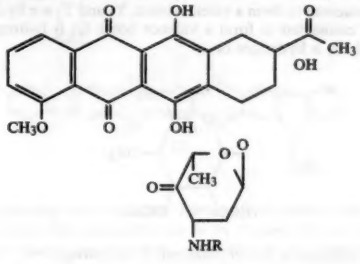
stereospecifically reducing said epimeric mixture with sodium borohydride as hereinabove described to obtain a 1:1 mixture of 4'-epi-N-trifluoroacetyl daunorubicin (Va) and 3'-4'-diepi-N trifluoroacetyl daunorubicin VI a:

VIa

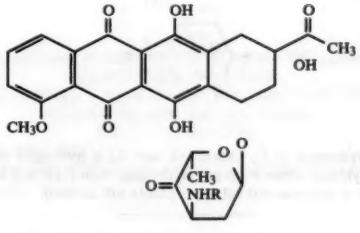


separating pure (VIa) from said mixture by chromatography on a column of silica gel buffered at pH 7 with M/15 phosphate buffer, removing the N-trifluoroacetyl group therefrom to obtain free 3',4'-diepi-daunorubicin base (VIII) and isolating same as the hydrochloride.

5. A compound of the formulae:



or



wherein R is—$COCF_3$ or —$COOCH_2CCl_3$.

4,345,069

DEFORMYLTYLOSIN DERIVATIVES

Hideo Sakakibara, Mishima; Tatsuro Fujiwara; Osamu Okegawa, both of Shizuoka; Eiichi Honda, Mishima; Susumu Watanabe, and Tetsuo Matsuda, both of Shizuoka, all of Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

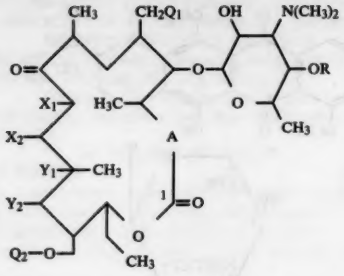
Filed Sep. 5, 1980, Ser. No. 184,375

Claims priority, application Japan, Sep. 19, 1979, 54-120269; Nov. 13, 1979, 54-146642

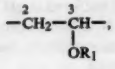
Int. Cl.³ C07H *17/08*

U.S. Cl. 536—7.1 **27 Claims**

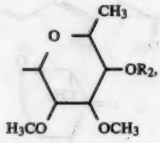
1. A compound of the formula



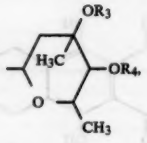
wherein A is



—CH=CH— or —CH_2—CH_2—, R_1 is hydrogen, lower alkanoyl or phenyl-lower alkanoyl, X_1 and X_2 are hydrogen or are connected to form a valence bond, Y_1 and Y_2 are hydrogen or are connected to form a valence bond, Q_1 is hydrogen or methyl, Q_2 is hydrogen or



R_2 is hydrogen or lower alkanoyl, R is hydrogen or



R_3 is hydrogen or C_{2-5} alkanoyl, and R_4 is hydrogen or C_{2-6} alkanoyl, and when R_3 is not hydrogen, then R_4 is not hydrogen, or a pharmaceutically acceptable salt thereof.

4,345,070

PROCESS FOR THE PREPARATION OF 4'-DEOXY-DAUNORUBICIN AND 4'-DEOXY-DOXORUBICIN

Antonino Suarato; Sergio Penco, both of Milan, and Federico Arcamone, Nerviano, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Filed Jun. 5, 1981, Ser. No. 270,877

Claims priority, application United Kingdom, Sep. 29, 1980, 8031382

Int. Cl.³ C07H *15/24*

U.S. Cl. 536—17 A **3 Claims**

1. A process for the synthesis of 4'-deoxydaunorubicin; comprising:

(a) reacting 4'-epi-N-trifluoroacetyldaunorubicin dissolved in methylene dichloride containing anhydrous pyridine with trifluoromethylsulfonic anhydride, thereby obtaining 4'-epi-4'-trifluoromethylsulfonyloxy-N-trifluoroacetyl-daunorubicin as an intermediate;

(b) reacting said intermediate with tetrabutylammonium iodide thereby obtaining 4'-deoxy-4'-iodo-N-trifluoroacetyldaunorubicin; and

(c) reductively dehalogenating said iodo daunorubicin derivative with tributyltin hydride in the presence of alpha, alpha'-azobisisobutyronitrile, thereby yielding said 4'-deoxydaunorubicin product.

3. 4'-Deoxy-4'-iodo-N-trifluoroacetyldaunorubicin.

4,345,071

DERIVATIVES OF PENICILLANIC ACID

Ernst T. Binderup, Tastrup, Denmark, assignor to Leo Pharmaceutical Products, Ltd. A/S, Ballerup, Denmark

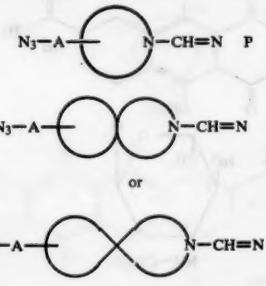
Division of Ser. No. 806,358, Jun. 14, 1977, Pat. No. 4,229,443. This application Jun. 30, 1980, Ser. No. 164,349

Claims priority, application United Kingdom, Jun. 29, 1976, 27107/76; Jul. 26, 1976, 31331/76; Feb. 9, 1977, 5436/77; Feb. 15, 1977, 6348/77

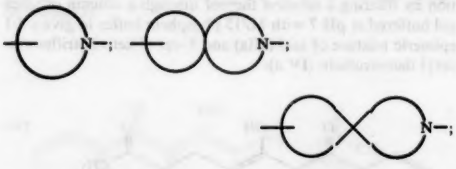
Int. Cl.³ C07D *499/10*

U.S. Cl. 542—420 **13 Claims**

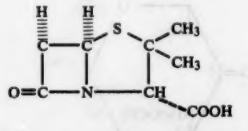
1. A compound of the following general formulae:



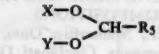
wherein —A— represents a straight or branched, saturated or unsaturated aliphatic hydrocarbon radical having from 1 to 6 carbon atoms, which radical optionally can be substituted with an amino radical; the groupings



represent saturated, monocyclic, bicyclic or spirocyclic ring systems, respectively, having from 4 to 11 carbon atoms in total; P stands for the penicillanic acid radical:



and salts of the compounds of said formulae with pharmaceutically acceptable, non-toxic organic and inorganic acids or bases, and easily hydrolyzable pharmaceutically acceptable, non-toxic esters of the penicillanic acid derivatives of said formulae including diesters of the the formula:



in which X and Y can be the same or different and stand for an acyl radical of one of the compounds of said formulae, and Y furthermore can be the acyl radical of other known β-lactam antibiotics, R_5 stands for hydrogen, methyl, ethyl, or phenyl, and salts of such esters with pharmaceutically acceptable, non-toxic acids or bases.

4,345,072

PROCESS FOR THE PRODUCTION OF 5-ARYLIDENE HYDANTOINS (B)

Axel Kleemann, Hanau; Theodor Lussling, Constance; Wolf Pfeifer, Bruhl, and Paul Scherberich, Constance, all of Fed. Rep. of Germany, assignors to Degussa AG, Frankfurt, Fed. Rep. of Germany

Filed Apr. 6, 1981, Ser. No. 251,540

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1980, 3013647

Int. Cl.³ C07D *233/72, 233/76*

U.S. Cl. 542—442 **14 Claims**

1. In a process for the production of a 5-arylidene hydantoin which is substituted or unsubstituted in the aromatic nucleus by condensation of the corresponding substituted or unsubstituted aromatic aldehyde with hydantoin the improvement comprising carrying out the condensation in the presence of at least one ammonium salt of an aliphatic or aromatic carboxylic acid.

4,345,073

7,7'-DIAMINO DERIVATIVES OF 2,2'-SPIRODIBENZOPYRANES

Hans Baumann, Wachenheim, and Andreas Oberlinner, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

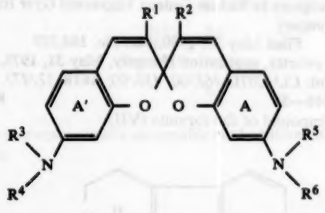
Division of Ser. No. 894,095, Apr. 6, 1978, Pat. No. 4,316,027, which is a division of Ser. No. 773,337, Mar. 1, 1977, Pat. No. 4,110,348. This application Jan. 29, 1981, Ser. No. 229,651

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1976, 2611600

Int. Cl.³ C07D *273/01, 241/04, 211/18*

U.S. Cl. 544—70 **6 Claims**

1. A dye intermediate of the formula

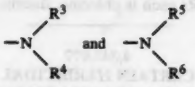


wherein:

R^1 is hydrogen; alkyl of 1 to 12 carbon atoms; phenyl; phenyl substituted by alkyl of 1 to 4 carbon atoms, methoxy, ethoxy, chlorine or bromine; or phenylalkyl of 7 to 10 carbon atoms; R^2 is hydrogen; or

R^1 and R^2 when taken together are dimethylene, trimethylene or tetramethylene, which are unsubstituted or substituted by alkyl of 1 to 12 carbon atoms;

R^3, R^4, R^5, and R^6 may each be alkyl of 1 to 6 carbon atoms, and at least one of the groups



must represent a radical derived from pyrrolidine, piperidine, morpholine, N'-alkylpiperazine in which alkyl has 1 to 4 carbon atoms or isoindoline.

4,345,074

PROCESS FOR THE MANUFACTURE OF A VIOLET ORGANIC PIGMENT, C.I. PIGMENT VIOLET 23

Theobald Hufnagel, Freigericht, and Manfred Hetschko, Rodenbach, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main Fechenheim, Fed. Rep. of Germany

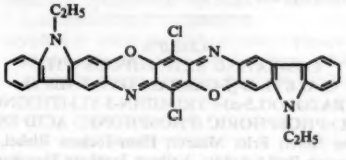
Filed Mar. 16, 1981, Ser. No. 244,034

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1980, 3010949

Int. Cl.³ C07D *265/34*

U.S. Cl. 544—99 **3 Claims**

1. In the process for the manufacture of the organic pigment of the formula



by condensing and cyclizing 3-amino-9-ethylcarbazole with excess tetrachlorobenzoquinone in an organic solvent in the presence of acid acceptors, the improvement comprises carrying out the condensation reaction in the presence of 0.1 to 4% of water, relative to the total weight of the reaction mixture.

4,345,075

4-AMINO-6-(2'-CARBOXYETHYL)-3-METHYLTHIO-1,2,4-TRIAZIN-5(4H)-ONE

Richard H. Wiley, 8 Roosevelt Clr., Palo Alto, Calif. 94306

Filed Sep. 10, 1981, Ser. No. 300,906

Int. Cl.³ C07D *253/06*

U.S. Cl. 544—182 **1 Claim**

1. 4-Amino-6-(2'-carboxyethyl)-3-methylthio-1,2,4-triazin-5(4H)-one.

4,345,076

CERTAIN HERBICIDAL N-(PARA-(6-CHLORO-3-PYRIDAZINYLOXY)PHENYL)-TRIFLUOROMETHANESULFONAMIDES

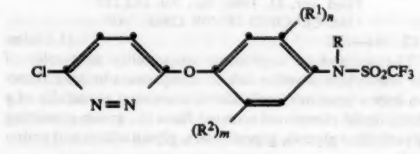
Kurt H. Pilgram, and Richard D. Skiles, both of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 4, 1980, Ser. No. 118,353

Int. Cl.³ C07D *237/14*

U.S. Cl. 544—241 **1 Claim**

1. A compound of the formula:



wherein R is hydrogen or $-SO_2CF_3$, m and n each is zero or one, and R^1 and R^2 each is chlorine, fluorine or methyl.

4,345,077

CERTAIN HERBICIDAL N-(META-(6-CHLORO-3-PYRIDAZINYLOXY)PHENYL)-TRIFLUOROMETHANESULFONAMIDES

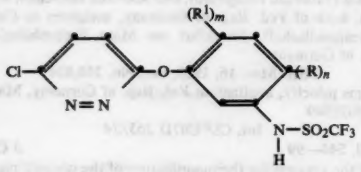
Kurt H. Pilgram, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 4, 1980, Ser. No. 118,354

Int. Cl.³ C07D *237/14*

U.S. Cl. 544—241 **2 Claims**

1. A compound of the formula



wherein m and n each is zero or one, R is nitro, methyl, chlorine or fluorine, and R^1 is methyl, chlorine or fluorine.

4,345,078

COMBATING ARTHROPODS WITH O-ALKYL-O-[5-CARBALKOXY-7-ALKYL-PYRAZOLO(1,5-α)-PYRIMIDIN-2-YL]-(THIONO) (THIOL)-PHOSPHORIC (PHOSPHONIC) ACID ESTERS

Wolfgang Hofer; Fritz Maurer; Hans-Jochem Riebel, all of Wuppertal; Rolf Schröder, Velbert; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

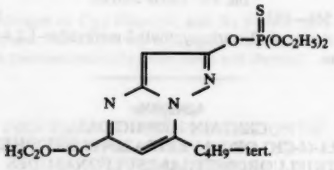
Filed Sep. 26, 1977, Ser. No. 836,339

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1976, 2644642

Int. Cl.³ C07D *487/04;* A01N *9/22*

U.S. Cl. 544—244 **1 Claim**

1. O,O-diethyl-O-[5-carbethoxy-7-tert.-butyl-pyrazolo(1,5-α)-pyrimidin(2)yl]-thionophosphoric acid ester of the formula



4,345,079

SCOOPABLE TRIETHYLENE DIAMINE

Floyd L. Hyman, Wilmington, Del., and Martin H. Ziv, Springfield, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 21, 1980, Ser. No. 142,210

Int. Cl.³ C07D *487/08;* C09K *3/00*

U.S. Cl. 544—351 **11 Claims**

1. The method of improving scoopability properties of stored triethylene diamine which comprises admixing therewith a minor amount of an additive consisting essentially of a normally liquid compound selected from the group consisting of polyethylene glycols, glycol esters, glycol ethers and amino alcohols.

4,345,080

PYRIDINETHIONE SALTS AND HAIR CARE COMPOSITIONS

Raymond E. Bolich, Jr., Maineville, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 7, 1980, Ser. No. 119,347

Int. Cl.³ C07D *213/89;* A61K *7/06, 7/08*

U.S. Cl. 546—6 **4 Claims**

1. Heavy metal, magnesium or aluminum salts of N-hydroxy pyridinethione which are predominately flat platelet crystals having a mean sphericity less than about 0.65 and a median equivalent spherical diameter based on volume of at least about 2μ but less than about 15μ.

4,345,081

SPIRO[INDOLINE-3,4'-PIPERIDINE]S

Helen H. Ong, Whippany, N.J., and James A. Profitt, Goshen, Ind., assignors to American Hoechst Corporation, Bridgewater, N.J.

Continuation of Ser. No. 121,824, Feb. 15, 1980, Pat. No. 4,307,235, which is a continuation-in-part of Ser. No. 936,185, Aug. 23, 1978, Pat. No. 4,209,625, which is a continuation-in-part of Ser. No. 789,723, Apr. 21, 1977, abandoned. This application Oct. 17, 1980, Ser. No. 198,233 The portion of the term of this patent subsequent to Jun. 24, 1997, has been disclaimed.

Int. Cl.³ C07D *471/10*

U.S. Cl. 546—17 **34 Claims**

1. A compound which is 1-(2-chlorophenyl)-1'-methyl-spiro[indoline-3,4'-piperidine] and a pharmaceutically acceptable salt thereof.

4,345,082

PROCESS FOR THE PREPARATION OF HYDROXYAMINO-EBURNANE DERIVATIVES AND OCTAHYDROINDOLOQUINOLIZINE INTERMEDIATES

Csaba Szantay; Lajos Szabo; György Kalaus; Janos Sapi; Lajos Dancsi; Tibor Keve, and Maria Gazdac, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

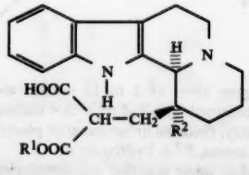
Filed May 29, 1980, Ser. No. 154,329

Claims priority, application Hungary, May 31, 1979, RI 713

Int. Cl.³ C07D *461/00, 455/00;* A61K *31/475*

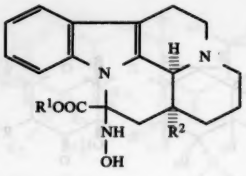
U.S. Cl. 546—51 **8 Claims**

1. A compound of the formula (VII)



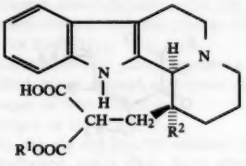
wherein R^1 and R^2 are each C_1 to C_6 alkyl, or a pharmaceutically acceptable salt thereof.

3. A process for the preparation of a compound of the formula (I)



wherein R^1 and R^2 are each C_1 to C_6 alkyl or a pharmaceutically acceptable acid addition salt thereof which comprises the step of:

nitrosating a compound of the formula (VII)



or

a pharmaceutically acceptable salt thereof in the presence of an acid with a compound selected from the group consisting of an alkali nitrite and a C_1 to C_6 alkyl nitrite to yield the desired product.

4,345,083

(1-METHYL-2-QUINOLINYLIDENE) DERIVATIVES OF GUANIDINE

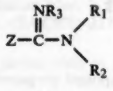
Chris R. Rasmussen, Ambler, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Continuation of Ser. No. 943,097, Sep. 18, 1978, Pat. No. 4,266,062. This application Dec. 10, 1979, Ser. No. 102,302

Int. Cl.³ C07D *401/12;* A61K *31/47*

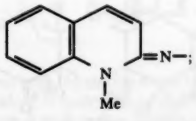
U.S. Cl. 546—163 **2 Claims**

1. A heterocyclic derivative of guanidine selected from the group consisting of a compound having the formula:



and the pharmaceutically-acceptable acid addition salts thereof wherein:

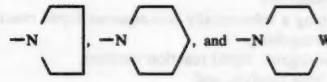
Z is



R_1 is a member selected from the group consisting of methyl and ethyl;

R_2 is a member selected from the group consisting of lower-alkyl, cyclopentyl, cyclohexyl and benzyl;

taken together represents a member selected from the group consisting of:



wherein W is a member selected from the group consisting of O, S, N-loweralkyl and N-phenyl; and

R_3 is a member selected from the group consisting of:

alkyl having from 4 to 10 carbons;

phenyl; methylenedioxyphenyl; phenyl substituted with from 1 to 3 substituents each selected from the group consisting of halo, loweralkyl and loweralkoxy; and phenyl substituted with a member selected from the group consisting of hydroxy, benzyloxy, loweralkanoyloxy, nitro; trifluoromethyl and methylthio;

naphthyl; cyclopentyl; cyclohexyl; exo-2-norbornyl; endo-2-norbornyl; 1-adamantyl;

arylalkyl in which the aryl function is phenyl and the alkyl function has from 1 to 4 carbons; and diphenyl in which the alkyl function has from 1 to 2 carbons.

4,345,084

UNSATURATED EICOSANOIC ACIDS

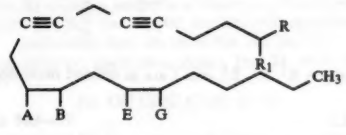
Ka-Kong Chan, Hopatcong; George W. Holland, and Perry Rosen, both of North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jun. 29, 1981, Ser. No. 278,531

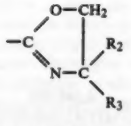
Int. Cl.³ C07D *263/10;* C07C *57/52, 57/00*

U.S. Cl. 548—237 **9 Claims**

1. A compound of the formula



wherein R is



R_1 is hydrogen or fluoro; A and B are individually hydrogen or taken together from a carbon to carbon bond with a cis configuration; E and G are individually hydrogen or taken together form a carbon to carbon bond with a cis configuration with the proviso that at least one of A and B taken together or E and D taken together form a carbon to carbon bond with a cis configuration; and R_2 and R_3 are hydrogen or lower alkyl; or pharmaceutically acceptable salts thereof.

4,345,085

METHOD FOR PREPARING 2-PYRAZOLIN-5-ONES FROM 1,2,4-OXADIAZOLES

Chang Kyu Kim; Cataldo A. Maggiulli, and Paul A. Zielinski, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,409
Int. Cl.³ C07D *231/52, 407/12*
U.S. Cl. 548—360 **14 Claims**

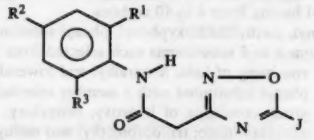
1. A method for preparing a 2-pyrazolin-5-one, which method comprises:

(a) forming a substantially non-aqueous liquid reaction system comprising:

(1) an organic liquid reaction medium,

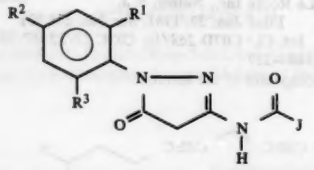
(2) a base catalyst, and

(3) a 1,2,4-oxadiazole represented by the structural formula:



wherein each of R^1, R^2 and R^3 is hydrogen, halo, alkyl having from 1 to 5 carbon atoms, or alkoxy having from 1 to 5 carbon atoms; and J is alkyl having from 1 to 20 carbon atoms, phenoxyalkyl with the alkyl portion thereof having from 1 to 20 carbon atoms, phenyl, alkoxyphenyl, furyl, phenoxyacylaminophenyl, or phenoxyalkyl substituted with one or more nitro radicals in at least one of the para or ortho positions; and

(b) heating said reaction system to a temperature sufficient to cause said 1,2,4-oxadiazole to rearrange to its corresponding 2-pyrazolin-5-one represented by the structural formula:



wherein R^1, R^2, R^3, and J are as defined hereinabove.

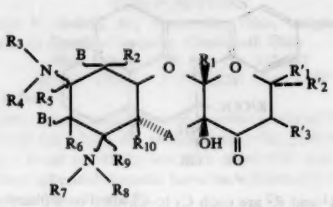
4,345,086

INTERMEDIATE COMPOUNDS IN THE PREPARATION OF SPECTINOMYCIN

David R. White, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 68,926, Aug. 23, 1979, Pat. No. 4,282,152. This application Dec. 4, 1980, Ser. No. 212,943
Int. Cl.³ C07D *327/08, 319/24*
U.S. Cl. 549—16 **1 Claim**

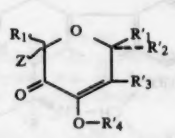
1. A process for preparing anomers and asteric mixtures of a compound having the formula:



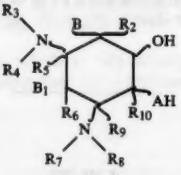
Ia

which comprises

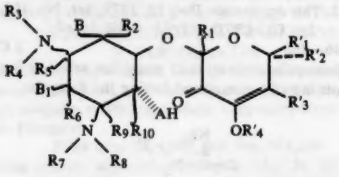
(a) reacting a compound having the formula:



with a compound having the formula

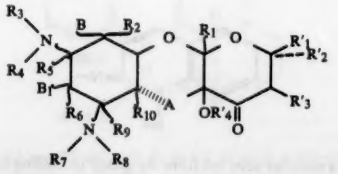


to prepare a compound having the formula

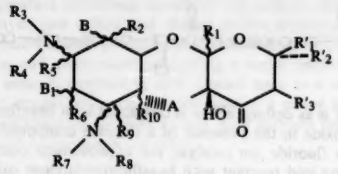


IVa

(b) reacting the compound prepared in Step (a) with silica gel to prepare a compound having the formula



(c) subjecting the compound prepared in Step (b) to alcoholysis to form a compound having the formula



and

(d) hydrolyzing the compound prepared in Step (c) to prepare the compound of Formula Ia;

Wherein R'_1 through R'_3 are the same or different and are selected from the group consisting of hydrogen, lower alkyl, acyloxyalkyl, lower haloalkyl, lower aminoalkyl, lower alkenyl, lower alkynyl, —OX and $—(CH_2)n$-OX and isomers thereof; with the proviso that R'_1 R'_2 and R'_3 are not hydroxy;

X is selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, and lower alkynyl;

n is an integer of from one to four;

R_1 is hydrogen or lower alkyl;

wherein R_2, R_5, R_6, R_9 and R_{10} are selected from the group consisting of hydrogen, lower alkyl, lower alkenyl and lower alkynyl; R_3, R_4, R_7 and R_8 are selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, lower alkynyl, and a blocking group selected from the group consisting of aralkoxycarbonyl, halogenated alkoxycarbonyl and alkoxycarbonyl; with the proviso that one of R_3 and R_4 is always a blocking group and one of R_7 and R_8 is always a blocking group; R'_4 is aroyl lower alkyl or acyl; A is selected from the group consisting of oxygen and sulfur; B and B_1 are the same or different and are selected from the group consisting of hydrogen, hydroxy, alkoxy, o-lower alkenyl, thio, thio-lower alkyl and thio-lower alkenyl and Z is halo.

4,345,087

PROCESS FOR PREPARING HETEROARYLBENZOXEPIN-ACETIC ACIDS, PRECURSORS AND DERIVATIVES THEREOF

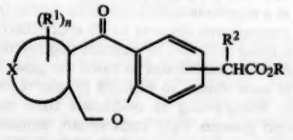
Arthur R. McFadden, East Brunswick, and Daniel E. Aultz, Middlesex, both of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Continuation of Ser. No. 788,752, Apr. 19, 1977, abandoned, which is a division of Ser. No. 607,926, Aug. 26, 1975, Pat. No. 4,025,640. This application Mar. 7, 1980, Ser. No. 128,252

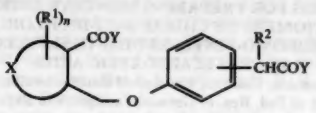
Int. Cl.³ C07D *333/16*

U.S. Cl. 549—44 **3 Claims**

1. A process for the preparation of a compound of the formula



wherein X together with the carbon atoms to which it attaches is a thienyl radical; R is hydrogen or a straight or branched chain alkyl of from 1 to 5 carbon atoms; R^1 is hydrogen or alkyl of 1 to 4 carbon atoms; R^2 is hydrogen or methyl; n is the integer 1, 2 or 3; and salts prepared from pharmaceutically acceptable bases, which comprises cyclizing under Friedel-Crafts conditions a diacid halide of the formula



wherein X, R^1, R^2 and n are as defined earlier and Y is bromine or chlorine and hydrolyzing.

4,345,088

PREPARATION OF ALKOXYAMINOHYDRIDOSILANES

Steven C. Vick, Stormville, and Bernard Kanner, West Nyack, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 31, 1981, Ser. No. 249,442

Int. Cl.³ C07F *7/10*

U.S. Cl. 556—410 **24 Claims**

1. A compound of the formula

wherein each R represents an alkyl group of from one to eight carbon atoms.

4,345,089

RECOVERY OF AROMATIC CARBOXYLIC ACID OR ESTER THEREOF FROM RESIDUE FRACTION OF OXIDATION OR ESTERIFICATION REACTION MIXTURE

Kenji Nagura; Shinichi Takeda; Koshi Namie; Takao Fujii; Michio Yamamoto, all of Matsuyama, and Seiichi Yokoyama, Tokyo, all of Japan, assignors to Hercofina, Wilmington, N.C.

Continuation of Ser. No. 870,800, Jan. 19, 1978, abandoned. This application Apr. 28, 1980, Ser. No. 144,756

Claims priority, application Japan, Jan. 24, 1977, 52-5748, 52-5749

Int. Cl.³ C07C *67/00, 51/42*

U.S. Cl. 560—77 **22 Claims**

1. In a process for preparing an aromatic carboxylic acid or its methyl ester by oxidizing in the liquid phase with molecular oxygen or a gas containing molecular oxygen in the presence of a heavy metal catalyst at least one aromatic compound having at least one methyl or formyl group bonded to a ring carbon atom of the aromatic ring to form an oxidation product comprising said aromatic carboxylic acid, and, if desired, methyl-esterifying the oxidation product to form a methyl-esterification product comprising the methyl ester of said acid, and separating at least 70% by weight of the acid or the ester from the oxidation product or the methyl-esterification product, whereby a residue comprising by-products having higher molecular weights than the acid or the ester is formed, the improvement which comprises contacting said by-products with hydrogen in the presence of a hydrogenation catalyst to convert at least part of the by-products to the aromatic carboxylic acid or its methyl ester or precursors of said acid or ester, and recovering said acid or ester or precursors.

4,345,090

PROCESS FOR PREPARING MENTHYL ESTERS OF ENANTIOMERS OF CHIRAL 3-(2,2-DICHLORO- AND -DIBROMO-VINYL)-2,2-DIMETHYLCYCLO-PROPANECARBOXYLIC ACIDS

Klaus Naumann, Cologne, and Rudolf Rauchschwalbe, Wuppertal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 26, 1980, Ser. No. 163,361

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1979, 2928406

Int. Cl.³ C07C *67/52, 69/743*

U.S. Cl. 560—124 5 Claims

1. A process for obtaining a substantially pure compound selected from the group consisting of the d-menthyl esters of 1R-cis/trans, 1S-cis/trans, 1R-cis-, 1S-cis-, 1R-trans- and 1S-trans-3-(2,2-dichloro- and -dibromo-vinyl)-2,2-dimethylcyclopropanecarboxylic acid, the l-menthyl esters of 1R-cis/trans-, 1R-cis, 1S-cis-, 1R-trans-, 1R-cis/trans, 1S-cis/trans, and 1S-trans-3-(2,2-dibromo-vinyl)-2,2-dimethyl-cyclo-propanecarboxylic acid and the l-menthyl esters of 1R-trans-, 1R-cis/-trans, 1S-cis/trans, and 1S-trans-3-(2,2-dichloro-vinyl)-2,2-dimethyl-cyclopropane-carboxylic carboxylic acid, comprising reacting d-menthol or l-menthol with a mixture of 1 RS-cis-, 1RS-trans or a mixture of 1RS-cis- and 1RS-trans-3-(2,2-dichloro- or -dibro-movinyl)-2,2-dimethylcyclopropanecarboxylic acids or acid chlorides of such acids in a solvent selected from the group consisting of an alkane with up to 10 carbon atoms, and an alcohol and a ketone containing up to 8 carbon atoms to form a solution of the menthyl esters, and cooling the solution and/or removing some of the solvent preferentially to crystallize out one or more esters while leaving the solution preferentially enriched in one or more esters.

4,345,091

METHOD OF PRODUCING N-BENZYLOXYCARBONYL-L-ASPARTIC ACID

Katsumi Sugiyama; Hideo Takeda, both of Kawasaki, and Hiroko Sato, Fuchu, all of Japan, assignors to Ajinomoto Company Incorporated, Tokyo, Japan

Filed Jan. 12, 1981, Ser. No. 224,477

Claims priority, application Japan, Feb. 4, 1980, 55-12315

Int. Cl.³ C07C *125/06*

U.S. Cl. 560—163 5 Claims

1. In the process of producing N-benzyloxycarbonyl L-aspartic acid by the reaction of a solution of L-aspartic acid or its sodium or potassium salt with a solution of benzyloxycarbonyl chloride, the improvement consisting essentially in carrying out the reaction while the pH is maintained within the range of 12.0 to 13.5 throughout the reaction.

4,345,092

PROCESS FOR ALKYL PERFLUORO(4,7-DIOXA-5-METHYL-8-FLUOROFOR-MYLNONANOATE

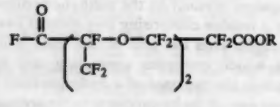
Paul R. Resnick, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 4, 1980, Ser. No. 175,273

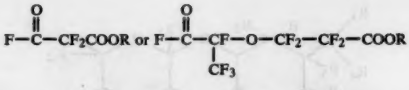
Int. Cl.³ C07C *67/343*

U.S. Cl. 560—182 10 Claims

1. In a process for preparing a product compound of the formula



where R is alkyl of 1–6 carbon atoms, wherein a reactant of the formula



where R is as defined above is contacted with hexafluoropropylene oxide in the presence of a fluoride compound which provides fluoride ion catalyst, the improvement comprising contacting said reactant with hexafluoropropylene oxide and said catalyst in the presence of a medium consisting essentially of two components, component A being 50 to 98% by volume of an aprotic liquid dinitrile in which methyl perfluoro (4-oxa-5-fluoroformylhexanoate) dissolves to the extent of less than 10 g/100 g of A at 20° C. or tetramethylenesulfone, and component B being 50 to 2% by volume of an aprotic liquid glyme, lactone or mononitrile in which said fluoride compound is soluble to the extent of at least 0.001% by weight at 20° C. and in which methyl perfluoro(4-oxa-5-fluoroformylhexanoate) dissolves to the extent of at least 10 g/100 g of B at 20° C., separating a heavier phase which contains said product compound from a lighter phase, and separating said product compound from said heavier phase.

4,345,093

ETHYLENE RECOVERY FROM ETHYL ACRYLATE PROCESS

Howard L. Pilat, Dallas; Jerry D. Moore, Houston, and Jack Chosnek, Corpus Christi, all of Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Jun. 29, 1981, Ser. No. 278,547

Int. Cl.³ C07C *69/54, 139/08*

U.S. Cl. 560—205 4 Claims

1. In a continuous process for the production of ethyl acrylate from ethylene and acrylic acid utilizing a sulfuric acid catalyst wherein the reaction products are distilled in a vacuum distillation system at a reduced pressure less than atmospheric to obtain a liquid ethyl acrylate product and also resulting in a first gaseous light ends stream from said vacuum distillation system containing sulfur dioxide and also containing ethylene and other organic light ends, and wherein losses of sulfuric acid catalyst are replenished by continuously passing to the reaction zone of said process a sulfuric acid make-up stream consisting of concentrated sulfuric acid having less than five percent by weight of water therein, the improvement which comprises: continuously and intimately contacting in a gas-liquid contact zone said first gaseous light ends stream with a reactant liquid consisting essentially of said liquid sulfuric acid make-up stream and the hereafter defined liquid recycle stream, said contacting being under such conditions as to cause ethylene in said first gaseous light ends stream to react with sulfuric acid in said reactant liquid so as to form ethyl hydrogen sulfate and diethyl sulfate, the said first gaseous light ends stream being at a temperature within the range of about 25° C. to 150° C. when passed to said contact zone, the initial temperature of said reactant liquid being within the range of about 40° C. to 150° C., and the pressure in said contact zone being maintained at a superatmospheric pressure within the range of about 1.05 atmospheres absolute to 20 atmospheres absolute, said pressure being sufficient to maintain said reactant liquid in the liquid phase but insufficient to cause the gases in said first gaseous light ends stream to dissolve in said reactant liquid; continuously withdrawing as overheads from said contact zone a second gaseous light ends stream containing sulfur dioxide, ethylene and other organic light ends, the amount of ethylene in said second gaseous light ends stream being less than the amount in said first gaseous light ends stream, the amount of sulfur dioxide in said second gaseous light ends stream being substantially the same as the amount of sulfur dioxide contained in said first gaseous light ends stream, the temperature of said second gaseous light ends stream being within the range of about 50° C. to 150° C.; continuously

withdrawing as bottoms from said contact zone a liquid bottoms product consisting essentially of sulfuric acid having ethyl hydrogen sulfate and diethyl sulfate dissolved therein, said liquid bottoms product being substantially free of sulfur dioxide; and continuously recycling a major portion of said liquid bottoms product to said contact zone as a said liquid recycle stream, and continuously passing a minor portion of said liquid bottoms product to said ethyl acrylate process as a source of make-up sulfuric acid.

4,345,094

PROCESS FOR THE PRODUCTION OF 6-HYDROXY-2-NAPHTHOIC ACID

Michael J. Mueller, Parkersburg, W. Va., and Carroll S. Montgomery, Somerville, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 127,703, Mar. 6, 1980, Pat. No. 4,287,357. This application Jun. 2, 1981, Ser. No. 269,075

The portion of the term of this patent subsequent to Sep. 1, 1998, has been disclaimed.

Int. Cl.³ C07C *51/15*

U.S. Cl. 562—425 **3 Claims**

1. In a process for preparing 6-hydroxy-2-naphthoic acid by reacting essentially anhydrous potassium 2-naphthoxide with carbon dioxide at an elevated temperature, and recovering 6-hydroxy-2-naphthoic acid therefore, the improvement which comprises forming a mixture of 2-hydroxynaphthalene and a potassium base, using about 0.8 to 1.2 moles of 2-hydroxynaphthalene per equivalent of potassium base; dehydrating said mixture; introducing carbon dioxide into said dehydrated mixture at about 20 psi to 90 psi at about 255° C. to 280° C., while agitating said mixture in a pressure reactor; heating said agitated mixture at said temperature and under said pressure until the ratio of 6-hydroxy-2-naphthoic acid to 3-hydroxy-2-naphthoic acid in the reaction mixture is at least 2, either diluting said reaction mixture with or discharging said reaction mixture into water containing sufficient sulfuric acid to bring the pH to at least 7, thereby form a two-phase mixture; separating the aqueous phase from the organic phase; contacting said aqueous phase with 0.1 gram of acetic acid per gram of expected 6-hydroxy-2-naphthoic acid and additional sulfuric acid to bring the pH to about 4.8–5.2 and recovering said 6-hydroxy-2-naphthoic acid.

4,345,095

PROCESS FOR THE PRODUCTION OF 6-HYDROXY-2-NAPHTHOIC ACID

Michael J. Mueller, Parkersburg, W. Va., and Carroll S. Montgomery, Somerville, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 127,703, Mar. 6, 1980, Pat. No. 4,287,357. This application Jun. 11, 1981, Ser. No. 272,607

Int. Cl.³ C07C *51/15*

U.S. Cl. 562—425 **7 Claims**

1. In a process for preparing 6-hydroxy-2-naphthoic acid by reacting essentially anhydrous potassium 2-naphthoxide with carbon dioxide at an elevated temperature, and recovering 6-hydroxy-2-naphthoic acid therefrom, the improvement which comprises forming a mixture of 2-hydroxynapthalene and a potassium base, using about 0.8 to 1.45 moles of 2-hydroxynaphthalene per equivalent of potassium base; dehydrating said mixture; introducing carbon dioxide into said dehydrated mixture at about 20 psi to 90 psi at about 255° C. to 280° C., while agitating said mixture in a pressure reactor; and heating said agitated mixture at said temperature and under said pressure before recovering said 6-hydroxy-2-naphthoic acid.

4,345,096

STEROID DERIVATIVES AND THEIR USE IN RADIOIMMUNOASSAYS

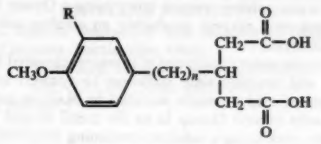
Jack Bernstein, New Brunswick; Ravi K. Varma, Belle Mead, both of N.J.; B. Richard Vogt, Yardley, Pa., and Frank L. Weisenborn, Titusville, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 4,092, Jan. 17, 1979, Pat. No. 4,221,725, which is a division of Ser. No. 901,952, May 1, 1978, Pat. No. 4,230,621, which is a continuation-in-part of Ser. No. 824,016, Aug. 12, 1977, abandoned. This application Mar. 10, 1980, Ser. No. 128,346

Int. Cl.³ C07C *59/52, 59/68*

U.S. Cl. 562—465 **4 Claims**

1. A compound having the formula



wherein R is hydrogen or an alkyl group having 1 to 3 carbon atoms and n is 3 or 4.

4,345,097

CHLORINATION OF PHENOLS AND PHENOXYACETIC ACIDS WITH SULFURYL CHLORIDE

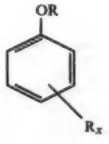
Kenneth J. Howard, North Little Rock, and Albert E. Sidwell, Jacksonville, both of Ark., assignors to Vertac Chemical Corporation, Memphis, Tenn.

Filed Jan. 21, 1980, Ser. No. 113,724

Int. Cl.³ C07C *39/32, 59/148*

U.S. Cl. 562—472 **9 Claims**

1. In the process for the chlorination of aromatic compounds having the formula:



wherein R is a member selected from the group consisting of hydrogen, carboxymethyl, and carboxyethyl and R_X is a member selected from the group consisting of hydrogen, 2-methyl, 2,5-dichloro and 2-chloro, with the proviso that when R is hydrogen, R_X is 2,5-dichloro, consisting of reacting said aromatic compound with sulfuryl chloride, and recovering a para chlorinated compound, the improvement consisting of conducting said reaction with sulfuryl chloride in the presence of elemental sulfur, with or without a like amount of a Friedel-Crafts acid, as a catalyst, and, optionally, an inert organic solvent at a temperature of from 30° C. to 250° C. while passing in a stoichiometric amount of said sulfuryl chloride uniformly over a period of about 30 minutes to 24 hours.

4,345,098

PROCESS FOR PRODUCING BENZENE CARBOXYLIC ACID SALTS AND THEIR ACIDS

Raymond A. Schep, Newport Beach, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Continuation-in-part of Ser. No. 69,466, Aug. 24, 1979, abandoned, which is a continuation of Ser. No. 883,935, Mar. 6, 1978, abandoned. This application Feb. 29, 1980, Ser. No. 126,143

Int. Cl.³ C07C *51/02, 51/353, 51/487*

U.S. Cl. 562—482 23 Claims

1. A process for producing isomerized benzene carboxylic acid salt from aromatic materials comprising:

a. treating a mixture of

i. an aromatic material,

ii. water, and

iii. a water soluble reagent comprising a Group Ia or IIa metal, said reagent producing an alkaline solution by hydrolysis,

with oxygen under conditions of pressure, elevated temperature, and reaction time sufficient to convert at least a portion of said aromatic material to benzene carboxylic acid salts of said Group Ia or IIa metal of said reagent, thereby producing a solution containing dissolved therein said benzene carboxylic acid salts;

b. removing sufficient water from said solution so that said benzene carboxylic acid salts can be isomerized, thereby producing dried benzene carboxylic acid salts;

c. isomerizing said dried benzene carboxylic acid salts by heating to produce an isomerized benzene carboxylic acid salt without converting said benzene carboxylic acid salts to benzene carboxylic acid salts of a different Group Ia or IIa metal prior to isomerizing said benzene carboxylic acid salts, and without converting said benzene carboxylic acis salts to benzene carboxylic acids prior to isomerizing said benzene carboxylic acid salts; and

d. recovering said isomerized benzene carboxylic acid salt.

13. The process of claim 1, 2, 3 or 4 wherein said isomerized benzene carboxylic acid salt comprises dipotassium terephthalate.

4,345,099

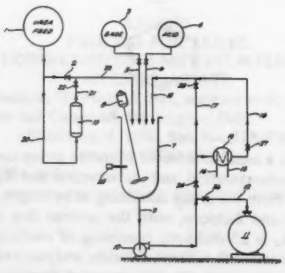
METHOD OF SELECTIVELY REMOVING BIURET FROM UREA AND COMPOSITIONS FOR USE THEREIN

Donald C. Young, Fullerton, and James A. Green, II, Chino, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Aug. 10, 1981, Ser. No. 291,428

Int. Cl.³ C07C *127/01, 126/08*

U.S. Cl. 564—63 18 Claims



9. A method for reducing the biuret content of urea containing biuret, which method comprises contacting said urea and biuret in aqueous solution at a temperature between about 0° C. and about 100° C. for a period of at least about four hours with a strong base capable of producing a pH of at least about 12.5, the concentration of said base being sufficient to maintain a pH of at least about 12.5 during said period and to reduce the biuret concentration and decrease and biuret/urea ratio in said solution.

4,345,100

PREPARATION OF α-KETOCARBOXYLIC ACID N-TERT.-BUTYLAMIDES

Gerhard Bonse, Cologne, and Heinz U. Blank, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 2, 1981, Ser. No. 222,222

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1980, 3002203

Int. Cl.³ C07C *102/08*

U.S. Cl. 564—124 10 Claims

1. A process for the preparation of an -ketocarboxylic acid N-tert.-butylamide of the formula

$$R—CO—CO—NH—C(CH_3)_3$$

in which

R is an aliphatic radical with up to 8 carbon atoms, a cycloalkyl radical with 3 to 6 carbon atoms, a phenyl or naphthyl radical or a morpholinyl, imidazolyl, pyrazolyl, pyrrolyl, isoxazolyl, piperidinyl, oxazolyl, 1,2,4-triazol-1-yl, 1,2,4-triazol-4-yl, 1,2,3-triazolyl, 1,2,4-thiadiazol-2-yl, benzimidazolyl or furanyl radical, comprising reacting an acyl cyanide of the formula

$$R—CO—CN$$

with an approximately equimolar amount of tert.-butyl methyl ether of the formula

$$(CH_3)_3C—O—CH_3$$

at a temperature between about 0° and 80° C. in the presence of an acid which is capable of activating the ether of formula (III) under the reaction conditions to give a tert.-butyl-carbonium ion, and then hydrolyzing the reaction mixture.

4,345,101

PROCESS FOR PURIFYING AN AQUEOUS SOLUTION OF ACRYLAMIDE

Shiro Asano, Takaishi; Kohei Shizuka; Yoshihiko Kambara, both of Chiba; Junji Mikami; Hiroshi Kato, both of Takaishi, and Tadatoshi Honda, Kanagawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Jun. 2, 1981, Ser. No. 269,602

Claims priority, application Japan, Jun. 18, 1980, 55-81384

Int. Cl.³ C07C *103/133*

U.S. Cl. 564—206 9 Claims

1. A process for purifying a crude aqueous acrylamide solution obtained by catalytically hydrating acrylonitrile with water in the presence of a copper-based catalyst, the improvement which comprises subjecting the crude aqueous acrylamide solution, in sequence, to: (a) a step of distilling off substantially all of unreacted acrylonitrile, (b) a step of removing substantially all of copper contained therein, (c) a step of allowing the aqueous acrylamide solution to stand under basic conditions, (d) a step of subjecting the aqueous acrylamide solution to a cation exchange treatment and then (e) a step of subjecting the solution to a weakly basic anion exchange treatment.

4,345,102

PROCESS FOR PRODUCING ETHYLENE GLYCOL MONO-T-BUTYL ETHER

Tadashi Matsumoto; Osamu Kuratani; Yasunori Hirose, all of Soka, and Susumu Toba, Saitama, all of Japan, assignors to Maruzen Oil Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 70,761, Aug. 30, 1979, abandoned. This application Jun. 3, 1980, Ser. No. 156,136
Claims priority, application Japan, Aug. 30, 1978, 53-105814
Int. Cl.³ C07C *41/06*
U.S. Cl. 568—678 **15 Claims**

1. A process for producing ethylene glycol mono-t-butyl ether which comprises contacting a starting mixture consisting of ethylene glycol di-t-butyl ether, and ethylene glycol with a strongly acidic cation-exchange material to react said ethylene glycol di-t-butyl ether with said ethylene glycol in the presence of the strongly acidic cation-exchange material as a catalyst to produce ethylene glycol mono-t-butyl ether.

4,345,103

HYDROXYMETHYLATION OF THE CARBON RESIDUE OF ORGANOSILICON COMPOUNDS

Leonard Kaplan, Dunbar, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 29, 1981, Ser. No. 278,898
Int. Cl.³ C07C *29/00*
U.S. Cl. 568—840 **7 Claims**

1. The process for making alcohols having one carbon and one oxygen more than the carbon residue of an organosilicon compound comprising reacting in the homogeneous liquid phase an organosilicon compound having bonded to silicon a carbon residue (R) and a group (X) wherein said group (X) is such that a transition metal can add across its bond to silicon, with carbon monoxide and hydrogen in the presence of an effective amount of a ruthenium carbonyl complex at a temperature and pressure sufficient to form alcohol products having one carbon and one oxygen more than the carbon residue (R) of said organosilicon compound.

4,345,104

PROCESS FOR THE PRODUCTION OF ETHYLENE GLYCOL

Jean B. Cropley, Scott Depot, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 30, 1981, Ser. No. 278,962
Int. Cl.³ C07C *29/32, 31/20*
U.S. Cl. 568—852 **18 Claims**

1. A process for the production of ethylene glycol by the oxidative coupling of methanol in the vapor state wherein said process comprises:

(1a) introducing methanol and oxygen into a first reaction zone at a temperature sufficient to form hydroxymethyl radicals in the vapor state and;

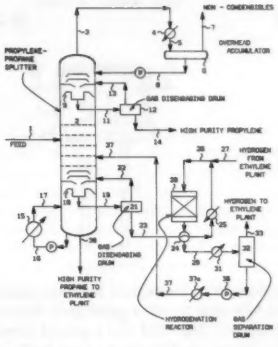
(1b) introducing the hydroxymethyl radicals into a reaction zone wherein said oxidative coupling occurs at a temperature between about 450° C. and 800° C. in the vapor state, said second reaction zone being substantially oxygen free.

4,345,105

REDUCING METHYLACETYLENE CHARGED TO AN ETHYLENE PRODUCTION

David L. Rogers, Demopolis, Ala., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 12, 1980, Ser. No. 177,314
Int. Cl.³ C07C *5/05, 4/02, 2/00, 5/00*
U.S. Cl. 585—271 **6 Claims**



1. A process for the elimination of methylacetylene which comprises:

(a) in a fractionation zone, fractionating a stream containing propane, propylene and methylacetylene to obtain a fraction of enriched methylacetylene content;

(b) passing said fraction to a hydrogenation zone; and

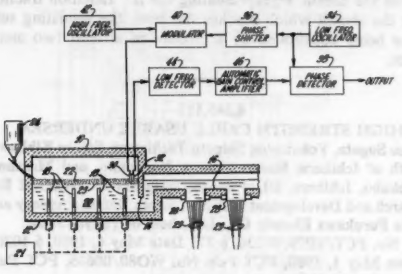
(c) hydrogenating the methylacetylene in said fraction.

4,345,106

METHOD OF AND APPARATUS FOR DETECTING THE LEVEL OF MOLTEN GLASS IN A GLASS MELTING FURNACE

Sheldon A. Canfield, Newark, and Paul S. Sanik, Westerville, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 6, 1980, Ser. No. 194,481
Int. Cl.³ C03B 5/02
U.S. Cl. 373—27 7 Claims



1. A method of detecting the level of molten glass in a furnace having a layer of batch material on the surface of the molten glass comprising the steps of:

a. generating a first electromagnetic wave signal of a known frequency;

b. phase shifting this first electromagnetic wave signal;

c. generating a second electromagnetic wave signal of a frequency higher than the first electromagnetic wave signal;

d. amplitude modulating the second electromagnetic wave signal with the phase shifted first electromagnetic wave signal;

e. transmitting the amplitude modulated second electromagnetic wave signal through the batch material to the molten glass;

f. reflecting the amplitude modulated second electromagnetic wave signal from the surface of the molten glass;

g. demodulating the reflected amplitude modulated second electromagnetic wave signal to produce a third electromagnetic wave signal which is the same frequency as the first electromagnetic wave signal;

h. amplifying this third electromagnetic wave signal;

i. comparing the phase shift or time position of the amplified third electromagnetic wave signal with that of the first electromagnetic wave signal; and

j. generating an output signal in response to this phase shift which is indicative of the level of molten glass in the furnace.

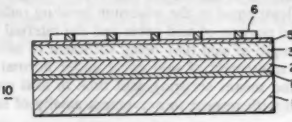
4,345,107

CADMIUM TELLURIDE PHOTOVOLTAIC CELLS

Gabor F. Fulop, King of Prussia; Jacob F. Betz, Quakertown; Peter V. Meyers, Coopersburg, and Mitchell E. Doty, Chalfont, all of Pa., assignors to Ametek, Inc., Paoli, Pa.

Continuation-in-part of Ser. No. 49,728, Jun. 18, 1979, Pat. No. 4,260,427. This application Dec. 15, 1980, Ser. No. 216,362
The portion of the term of this patent subsequent to Apr. 7, 1998, has been disclaimed.
Int. Cl.³ H01L 31/06
U.S. Cl. 136—255 44 Claims

1. A photovoltaic cell comprising an electrodeposited cadmium telluride film and a substrate facing and in intimate contact with one side of said film and forming an ohmic junction at the interface therebetween, said substrate having a rest potential, when initially inserted in an electrodeposition bath as an electrode, which is more positive than the rest potential of cadmium under the same conditions, the surface layer of said substrate forming said ohmic junction with said film comprising one or more metals selected from Group II B and Group III A of the periodic table.

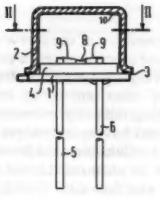


4,345,108

CASE FOR A SEMICONDUCTOR COMPONENT

Joachim Dathe, Munich, and Erich Schmidhuber, Regensburg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 13, 1980, Ser. No. 149,341
Claims priority, application Fed. Rep. of Germany, May 14, 1979, 2919404
Int. Cl.³ H05K 5/04
U.S. Cl. 174—52 H 2 Claims



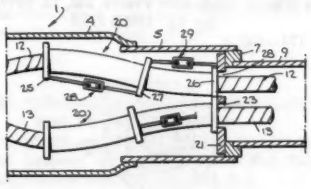
1. Case for a semiconductor component, comprising at least two parts, one of said parts being a cap, at least said cap being formed of a material having a low hydrogen permeability and a weak catalytic effect for an oxyhydrogen gas reaction, said material being an alloy of copper, nickel and zinc.

4,345,109

RESTRAINT APPARATUS FOR PIPE TYPE ELECTRIC CABLES

David A. Silver, Livingston; Attila F. Dima, Piscataway, and George W. Seman, Piscataway, all of N.J., assignors to Pirelli Cable Corporation, Union, N.J.

Filed Nov. 3, 1980, Ser. No. 203,253
Int. Cl.³ H02G 15/18
U.S. Cl. 174—84 R 13 Claims



1. In an electric cable installation in which a portion of an insulated cable is within a casing having an internal size greater than the cross-sectional size of the cable, whereby the cable may be bent into a curved shape within the casing, support means within said casing for restricting axial movement of said cable, said support means comprising a longitudinally curved

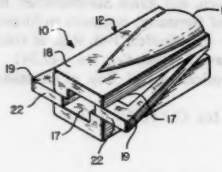
tube of an internal size greater than the cross-sectional size of a portion of the cable within said casing enclosing said last-mentioned portion of said cable, said tube having a radius of curvature at least equal to the minimum bending radius of said last-mentioned portion of said cable and the internal size, curvature and length of said tube being sufficient to substantially restrict axial movement of said cable under normal working conditions, and means securing said tube in said casing in a fixed position with respect to movement axially of said cable.

4,345,110

SCREW-ON ELECTRICAL CONNECTOR

George Ustin, 16V Scenic Dr., Croton-on-Hudson, N.Y. 10520

Filed Feb. 17, 1981, Ser. No. 234,932
Int. Cl.[3] H01R 4/12
U.S. Cl. 174—87 7 Claims



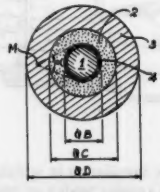
1. In an electrical connector of the screw-on type for joining the ends of two or more electric wires, a cap of stiffly flexible insulating material having a generally central bore open at one end and closed at the other end by an integral end wall, a generally L-shaped longitudinally extending lever having a plain end and a foot end having an integral axially extending and inwardly directed extension, said lever being outwardly pivotally connected at its plain end to said cap at or near said open end thereof and said foot end of said lever being axially slidably connected to said cap at said end wall thereof, and said cap having an inwardly directed longitudinally extending channel, keyed to said lever and so shaped and so disposed as to receive and contain said lever, whereby said lever may be pivoted to a position partially out of said channel, thereby providing leverage for turning said connector down on said wires, and whereby said lever may be pivoted into said channel, in which position said foot end of said lever will lie snugly against said end wall of said cap, thus providing a bulwark against said ends of said wires poking through said connector.

4,345,111

ELECTRIC CONDUCTING CABLE INSENSITIVE TO NUCLEAR RADIATION

Hubert Petitcolas, Sassenage, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 11, 1980, Ser. No. 167,671
Claims priority, application France, Jul. 12, 1979, 79 18123
Int. Cl.[3] H01B 7/18
U.S. Cl. 174—102 A 7 Claims



1. An electrical conducting cable which is insensitive to nuclear radiation comprising at least one electrically conductive core, at least one layer of an electrically insulating substance surrounding said conductive core and at least one electrically conductive sheath surrounding said insulating layer, wherein the diameter ϕ_D of the sheath, the diameter ϕ_B of the conductive core, the diameter of ϕ_C of the insulating layer are linked by the equation:

$$\frac{\phi_B^2}{\phi_D^2 - \phi_C^2} = \frac{F_2}{F_1} \cdot \frac{1}{360} \, 2 \arcsin \frac{2\phi_B}{\phi_D + \phi_C}$$

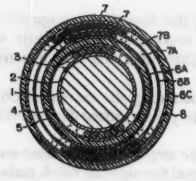
F_1 representing the β^- radiation fraction from the core which reaches the sheath, F_2 representing the β^- radiation fraction from the sheath which reaches the core, the insulating substance being constituted by a mixture of at least two metal oxides.

4,345,112

HIGH STRENGTH CABLE USABLE UNDERSEA

Shigeo Sugata, Yokohama; Shigeru Tachigami; Satoru Kikkawa, both of Ichihara; Haruo Umezu, Narashino, and Masanori Ohkubo, Ichihara, all of Japan, assignors to Technical Research and Development Institute, Japan Defence Agency and The Furukawa Electric Co., Ltd., both of Tokyo, Japan

PCT No. PCT/JP79/00236, § 371 Date May 6, 1980, § 102(e) Date May 1, 1980, PCT Pub. No. WO80/00635, PCT Pub. Date Apr. 3, 1980
PCT Filed Sep. 5, 1979, Ser. No. 198,951
Claims priority, application Japan, Sep. 6, 1978, 53/109401
Int. Cl.[3] H01B 7/18
U.S. Cl. 174—107 5 Claims



1. A high strength cable usable undersea and comprising an inner sheath provided outside a cable core for transmitting a communication signal or electric power and a tension member of a twisted layer and an outer sheath successively provided outside said inner sheath, characterized in that said tension member comprises a plurality of twisted layers, a lapping tape having a high friction coefficient is provided between said tension member and said outer sheath, and a lapping tape having a high friction coefficient is interposed between the adjacent twisted layers.

4,345,113

AUTOMATIC TELEPHONE MESSAGE INTERCEPTION SYSTEM

Edwin F. Shelley, 339 Oxford Rd., New Rochelle, N.Y. 10804

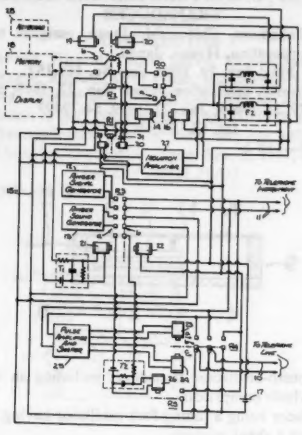
Filed Jan. 14, 1980, Ser. No. 111,989
Int. Cl.[3] H04M 1/64
U.S. Cl. 179—2 A 9 Claims

1. An automatic telephone message interception system adapted to be coupled in series with a telephone transmission line and a telephone instrument for connecting an incoming telephone call on said transmission line to an information storage means without ringing said telephone instrument, comprising

first means, coupled to said transmission line and said telephone instrument, for electrically disconnecting said transmission line from said telephone instrument and normally maintaining said transmission line electrically disconnected from said instrument,

second means, coupled to said first means and to said tele-

phone transmission line, for detecting a first coded transmission signal transmitted on said transmission line during an incoming telephone call and connecting said transmission line to said information storage means in response to the detection of said signal, and



third means, coupled to said first means, second means and said transmission line, for detecting a second coded transmission signal transmitted on said transmission line during said incoming telephone call and disconnecting said transmission line from said information storage means in response to the detection of said second signal.

4,345,114

METHOD AND APPARATUS FOR RECORDING AND REPRODUCING A MESSAGE WITH AN INDICATION OF A TIME OCCURRENCE

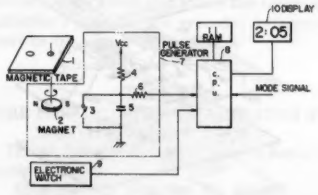
Takashi Sato; Tomio Tsuchiya, and Yasuo Matushima, all of Tokorozawa, Japan, assignors to Pioneer Ansafone Manufacturing Corporation, Saitama, Japan

Filed Apr. 28, 1980, Ser. No. 144,096

Claims priority, application Japan, Apr. 27, 1979, 54-51409

Int. Cl.³ H04M *1/65*

U.S. Cl. 179—6.16 **3 Claims**



1. A method of automatically recording and reproducing telephone messages on a tape, comprising the steps of:

recording a received message on a tape; producing pulses in synchronism with the advance of said tape in both the forward and reverse directions; counting up and down said pulses with the forward and reverse directions, respectively, of said tape advance to maintain a pulse count indicative of the tape position; storing in a memory, at the time of recording of a message, said pulse count corresponding to the tape position of said message along with an actual time indication obtained from an electronic clock; comparing during playback mode said pulse count representing the current position of said tape with said memorized pulse counts; and displaying during said playback mode said memorized time indication which was memorized along with a pulse count that compares equally with the current pulse count, whereby the time of recording of a message is indicated when said message is played back.

4,345,115

TELEPHONE LINE INTERFACE

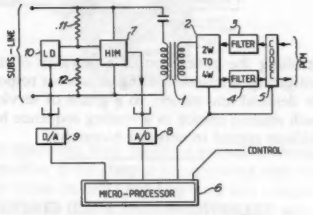
Anthony W. Sweet, Saffron Walden, England, assignor to Standard Telephones and Cables Limited, London, England

Filed Dec. 8, 1980, Ser. No. 214,326

Claims priority, application United Kingdom, Dec. 13, 1979, 7943074

Int. Cl.³ H04M *1/00;* H04Q *11/04;* H04B *3/36*

U.S. Cl. 179—18 FA **2 Claims**



1. A telephone subscriber's line interface for a system in which the telephone instruments and the connections therefrom to the exchange use analogue techniques while the exchange uses digital techniques such as pulse code modulation, in which the line is coupled to an analog network in said interface and via a two-wire to four-wire conversion circuit to separate GO and RETURN channels, in which the GO channel is coupled from the conversion circuit to analogue-to-digital conversion means which produces the digital output for use in the exchange, in which the RETURN channel is coupled from digital-to-analogue conversion means which re-creates speech for transmission to the subscriber's lines and said two-wire to four-wire conversion circuit, the invention in which said analog network includes a monitoring circuit having a high impendance connected to and individual to one of said analogue lines so as to monitor the line current and/or line voltage, means for coupling the output of the monitoring circuit via further analogue-to-digital conversion means to the input of a microprocessor common to a plurality of line interfaces to react to monitored line change conditions at said plurality of line interfaces under control of the output of the respective monitoring circuits and under a control connection from within the exchange, and further means for coupling the output of the microprocessor via which various signalling and other conditions applied to the line are coupled to said line via further digital-to-analogue conversion means and via a line driver circuit within said analog network.

4,345,116

DYNAMIC, NON-HIERARCHICAL ARRANGEMENT FOR ROUTING TRAFFIC

Gerald R. Ash, West Long Branch, N.J., and Richard H. Cardwell, North Andover, Mass., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 31, 1980, Ser. No. 221,971

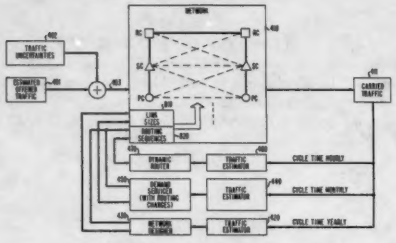
Int. Cl.³ H04M *7/00*

U.S. Cl. 179—18 EA **7 Claims**

1. A method for routing traffic through a network, said network including a plurality of nodes and a plurality of links for interconnecting predetermined nodes according to a predetermined interconnection pattern, a link including one or more servers,

said method including a step of alternate routing traffic

through said network according to a routing sequence, said sequence including a plurality of route choices between an originating node and a terminating node, and characterized in that said routing method further comprises the step of:



controlling the generation of a plurality of dynamic, cost mitigating, alternate routing sequences responsive to traffic demand and subject to a grade of service constraint, each routing choice in a routing sequence being allowed without regard to network hierarchy.

4,345,117

TELEPHONE LINE FEED CIRCUIT

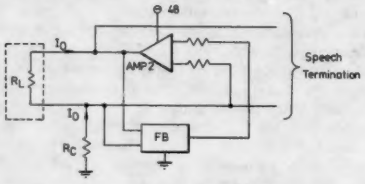
Anthony W. Sweet, Saffron Walden, England, assignor to Standard Telephones and Cables Limited, London, England

Filed Nov. 20, 1980, Ser. No. 208,559

Claims priority, application United Kingdom, Nov. 29, 1979, 7941245

Int. Cl.³ H04M *1/00*; H04B *3/16*

U.S. Cl. 179—77 **2 Claims**



1. A line-feeding arrangement for a telephone subscriber's line, which includes a constant current generator circuit connected to the speech wires of the line so as to supply direct current thereto, the circuit having a high impedance to speech currents, a monitoring circuit also connected to the speech wires of the line so as to monitor the direct voltage between the speech wires, said monitoring circuit also having a high impedance to speech currents, control means associated with the monitoring circuit and the generator circuit to cause the current generated by the generator circuit to be varied in accordance with variations in the line voltage as monitored by the monitoring circuit, in which the monitoring circuit includes an operational amplifier having one of its inputs connected to one of the speech wires, the other speech wire being connected to the output of the amplifier, and a feedback loop connected between the subscriber's line and the other input of the amplifier, which feedback loop provides said control means and in which the feedback loop includes a second operational amplifier having its inputs connected respectively to the two line wires, the second operational amplifier having a feedback resistor connected across it, and a third operational amplifier having one of its inputs resistor-coupled to the output of the second operational amplifier and its other input connected to a reference voltage source, a resistor connected between the output of the second operational amplifier and the first input of the third operational amplifier, and a capacitor connected from said first input to ground.

4,345,118

QUARTZ TUNING FORK ELECTRO-ACOUSTIC TRANSDUCER

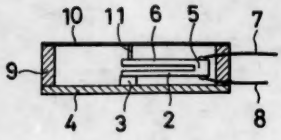
Seinosuke Takemura, Chitoseshi, Japan, assignor to Daiwa Shinku Corporation, Hyogo, Japan

Filed Jun. 19, 1980, Ser. No. 161,152

Claims priority, application Japan, Jun. 22, 1979, 54-79497; Jun. 22, 1979, 54-79498; Jun. 22, 1979, 54-79499

Int. Cl.³ H04R *17/00*

U.S. Cl. 179—110 A **5 Claims**



1. An acousto-electronic transducer including an oscillator of quartz, which comprises:

said oscillator being a tuning fork oscillator having a pair of tines and a shank portion;

said oscillator being located in a sealed casing;

said casing having a ceiling of a vibrant film;

one of said tines of said oscillator being fastened to the bottom of said casing while the other tine is connected to said vibrant film of said casing; and

said oscillator including a pair of electrodes.

4,345,119

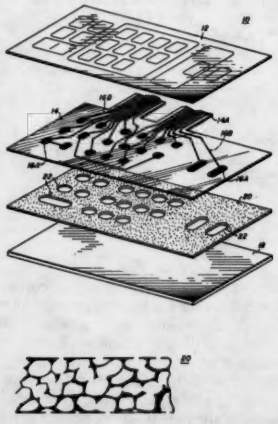
MEMBRANE SWITCH ASSEMBLY WITH IMPROVED SPACER

Leonard Latasiewicz, Hoffman Estates, Ill., assignor to Motorola Inc., Schaumburg, Ill.

Filed Feb. 19, 1981, Ser. No. 236,073

Int. Cl.³ H01H *13/04*

U.S. Cl. 200—5 A **5 Claims**



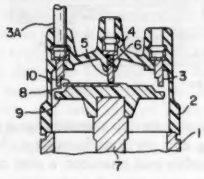
1. A membrane switch assembly comprising a flexible upper member bearing a plurality of contact areas on a first surface and a bottom member including at least one contact area on a first surface thereof and a foam felt spacer including a plurality of apertures in registration with at least the contact areas on

the upper member, and wherein said spacer is adhesively attached to the first surface of the upper member, and to the first surface of the bottom member, and is composed of a resilient, non-conductive, open-cell, non-reticulated foam felt material.

4,345,120
DISTRIBUTOR

Hiroji Sawada, Hitachi; Tatsuo Igawa, Kitaibaraki, and Hiromitsu Nagae, Katsuta, all of Japan, assignors to Nissan Motor Company, Limited and Hitachi, Ltd., both of Tokyo, Japan

Continuation of Ser. No. 938,363, Aug. 31, 1978, abandoned.
This application Sep. 15, 1980, Ser. No. 187,139
Claims priority, application Japan, Sep. 2, 1977, 52-104856
Int. Cl.³ H01H *19/00*
U.S. Cl. 200—19 R **6 Claims**



1. A distributor for an internal combustion engine comprising center electrode means, rotor electrode means, side electrode means disposed opposite to said rotor electrode means with a discharge gap defined therebetween, and means for distributing high-voltage pulses generated by an ignition coil to individual ignition plugs through said center electrode means, said rotor electrode means and said side electrode means, wherein at least one of said rotor electrode means and said side electrode means has its discharge-participating area formed from only ferrite, whereby said high-voltage pulses generated by said ignition coil are distributed to said side electrode means which establishes a main-ignition preceded by a pre-ignition which occurs on the surface of said ferrite.

4,345,121
MINIATURE LIGHTED PIVOTED ACTUATOR SWITCH WITH INTEGRAL LOCK

Richard B. Tenner, Oak Creek, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 19, 1981, Ser. No. 245,429
Int. Cl.³ H01H *27/00*
U.S. Cl. 200—42 R **6 Claims**

1. A self-enclosed miniature pivoted-actuator switch with an integral lock comprising:

a switch housing;

stationary contact means within said housing electrically continuous with external terminals;

movable contactor means within said housing selectively operable between different operating positions closing and opening at least one circuit with respect to said stationary contact means;

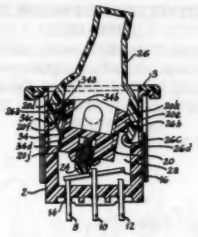
an abutment within said housing;

an opening into said housing;

and a switch operator subassembly extending through said opening into said housing for operating said movable contactor means comprising:

an actuator and means pivotally supporting the same in said housing for reciprocal movement to actuate said contactor means;

a resilient locking member and means mounting the same to said actuator at one end portion so that its other end portion abuts said abutment to prevent pivotal operation of said actuator from one operating position to another;



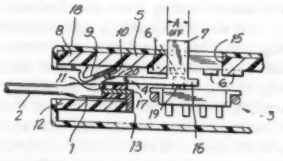
a removable operating lever having a manually engageable external portion to be grasped for operating said switch;

and snap-on means on said operating lever and complemental snap-on means on said actuator for coupling said operating lever and said actuator in an operative relationship, said snap-on means on said operating lever also deflecting said locking member clear of said abutment to allow free operation of said switch operator subassembly from said one operating position to another.

4,345,122
DETACHABLE CORD

Frank Janniello, Stamford, Conn., assignor to Clairol Incorporated, New York, N.Y.

Filed Apr. 27, 1981, Ser. No. 258,063
Int. Cl.³ H01H *9/20*
U.S. Cl. 200—50 B **2 Claims**



1. A mechanical interlock system for use with a detachable electric cord for preventing arcing between the contacts comprising:

a female socket, in an electrically powered device requiring high current, said socket having therein female electrical contacts for receiving male electrical contacts of a detachable plug and having on the inside wall thereof a strip of spring metal biased toward the center of the socket, said spring metal having a pin on the surface thereof facing toward the longitudinal axis of the socket;

a switch in said electrically powered device having a sliding control member having a longitudinal extension with respect to said socket which extends into said socket adapted to lift the spring metal radially away from said axis of the socket when the sliding control member is in the "off" position longitudinally toward the front of said socket and to release the spring metal strip when the sliding control member is in an "on" position in a direction longitudinally toward the rear of the socket; a plug with

male electrical contacts insertable into said socket to make electrical contact with said female electrical contacts, said plug having a groove in its insulation for receiving said pin on the spring metal strip when said plug is in said socket and said sliding control member is in an "on" position, locking the socket in place, wherein said plug can be inserted or removed from said socket only when the sliding control member is in the "off" position.

4,345,123

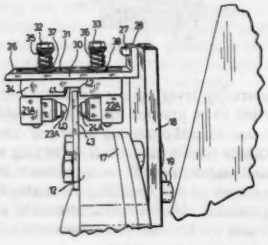
SELF-ADJUSTING BRAKE ENGINE LIMIT SWITCH ASSEMBLY

Peter deH. Eastcott; Peter T. Truman, and Serge L. Scuccato, all of Peterborough, Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

Filed Sep. 24, 1980, Ser. No. 190,216

Int. Cl.³ H01H *3/16*

U.S. Cl. 200—52 R **2 Claims**



1. A self-adjusting limit switch assembly for a brake engine having a brake applying and releasing mechanism which moves inwardly and outwardly in a first predetermined direction for moving at least one brake shoe to a brake applying position and a brake released position, said limit switch assembly comprising

mounting means fixed to said brake engine and having a slot therethrough extending in said first direction,

a slide having a first and second side, said first side being in sliding engagement with said mounting means,

fastening means extending from said first side of said slide through said slot and engaging said mounting means for mounting said slide to said mounting means for slidable movement in said first direction, said fastening means including spring bias means for providing a frictional force tending to resist movement of said slide,

said slide having on said second side first and second surfaces, spaced apart and extending in a second direction at right angles to said first direction, defining a transverse slot,

first and second microswitches mounted on said slide and having a respective actuating member extending slightly past a plane defined by said respective first and second surface,

an actuator arm extending from said brake applying and releasing mechanism and terminating in said transverse slot,

said arm engaging said first surface as the brake applying and releasing mechanism moves outwardly to the brake released position for moving said slide to an adjusted operating position,

the actuating member of said first microswitch being operated by said arm when said brake applying and releasing mechanism moves to said brake released position, and the actuating member of said second microswitch being operated by said arm when said brake applying and releasing mechanism moves to said brake applying position and said brake shoe is worn sufficiently to require adjustment.

4,345,124

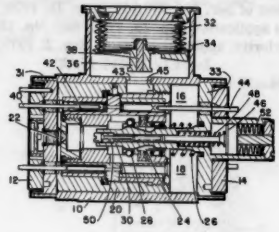
ACCELERATION SWITCH

Joseph P. Abbin, Jr., Albuquerque; Howard F. Devaney, Cedar Crest, and Lewis W. Hake, Albuquerque, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 29, 1979, Ser. No. 70,545

Int. Cl.³ H01H *35/14*

U.S. Cl. 200—61.53 **5 Claims**



1. An acceleration actuated switch comprising: a generally tubular housing including end portions forming a chamber; a fixed electrical contact within said chamber; a post carried by an end portion and projecting into the chamber, said post having a portion of reduced diameter connected by a tapering portion with a more remote larger diameter portion; a movable mass having a recess therein normally disposed opposite said larger diameter portion of said post; a spring and damping fluid within said chamber, said spring normally maintaining said mass in an initial position, said mass being movable during acceleration along said post toward said fixed electrical contact in opposition to said spring and with transfer of damping fluid past said mass during said movement; a roller contacting said post and projecting into said recess; a collar for transmitting force between said spring and roller; a surface of said recess moving said roller from said larger diameter portion along said taper towards said smaller diameter portion during movement of said mass resulting in decreased rate of opposition by said spring against said mass.

4,345,125

SNAP ACTION SWITCHES

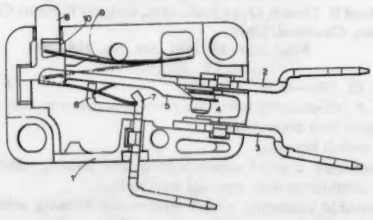
Michael I. Henville, Maidenhead, England, assignor to Unimax Switch Limited, Maidenhead, England

Filed Aug. 28, 1980, Ser. No. 182,223

Claims priority, application United Kingdom, Aug. 31, 1979, 7930346

Int. Cl.³ H01H *13/38*

U.S. Cl. 200—67 D **2 Claims**



1. A snap-action micro-switch comprising:

a casing having a plurality of mounting holes formed therein at preselected locations;

a fixed contact mounted within said casing;

an over-center snap action spring-loaded contact carrier

mounting a movable contact and movable within said casing between a normal rest position occupied in the absence of an externally applied force and an operative position, said fixed contact being engaged by said movable contact in the rest position of said carrier;

an actuating button having first and second ends and guided for linear sliding movement within said casing;

said first end of said actuating button projecting outwards of said casing and said second end of said button engaging said carrier at a point displaced from said movable contact for movement of said carrier from said rest position to said operative position on inward sliding movement of said button in an actuating direction relative to said casing, said movement being effectable against the spring force of said spring-loaded carrier; and

auxiliary spring means acting on said actuating button comprising a leaf spring located wholly within said casing and having first and second ends;

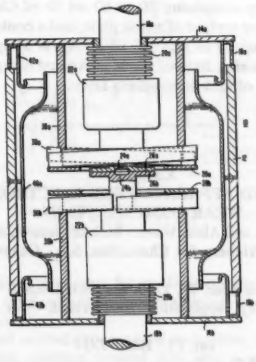
said first end of said spring being anchored in said casing and said second end of said leaf spring engaging said actuating button in the rest position thereof and being stressed such as to apply a force urging said button in said inward actuating direction but said force being insufficient to move said button unaided against the force of said spring-loaded carrier, and said applied force falling, though without changing direction on movement of said button in the actuating direction.

4,345,126

VACUUM INTERRUPTER WITH TRANSFER-TYPE AXIAL MAGNETIC FIELD CONTACTS

Sidney J. Cherry, Elmira, and Paul O. Wayland, Montour Falls, both of N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 1, 1980, Ser. No. 136,196
Int. Cl.³ H01H *33/66*
U.S. Cl. 200—144 B **7 Claims**



1. In a vacuum circuit interrupter in which a pair of primary current-carrying electrical contacts are relatively movable into closed position within a hermetically sealed, evacuated, generally cylindrical envelope, and wherein the primary current-carrying electrical contacts in the closed position carry the electrical line current to which the interrupter is connected, and which primary current-carrying electrical contacts are disposed at the extending ends of conductive support rods which are aligned along the cylindrical axis of the envelope and are sealed therethrough to external electrical connection means,

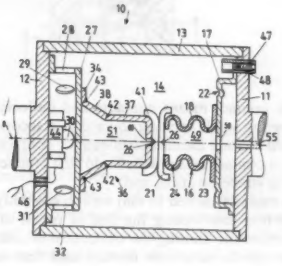
the improvement wherein annular transfer arcing contacts are disposed about each of the primary current-carrying contacts, which annular transfer arcing contacts comprise an annular arcing portion and an axial magnetic field generating portion extending from the back side of the annular arcing portion to a supporting conductive member, whereby when the primary current-carrying contacts are opened the arc which forms between these primary contacts as they are moved apart, transfers to the annular arcing portions of the annular transfer contact, and the arc current flowing through the magnetic field generating means produces an axial magnetic field parallel to the arc path between contacts to maintain the arc diffuse.

4,345,127

HIGH-VOLTAGE, BLAST-ACTUATED POWER SWITCH HAVING A COLLAPSIBLE CONTACT

Lutz Niemeyer, Baden, Switzerland, assignor to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Filed Jan. 9, 1980, Ser. No. 110,795
Claims priority, application Switzerland, Jan. 11, 1979, 245/79
Int. Cl.³ H01H *33/70*
U.S. Cl. 200—148 R **10 Claims**



1. A high-voltage, blast-actuated power switch comprising:

a switch casing having first and second electrically conductive external connections electrically insulated from each other and having a hollow chamber, said chamber being substantially filled with a high dielectric strength medium having low compressibility;

first and second switch contacts included in said hollow chamber, said first switch contacts being electrically connected to said first external connection and said second switch contact being electrically connected to said second external connection, said first and second switch contacts being in physical and electrical contact with each other thereby electrically connecting said first external connection to said second external connection; and

blasting cap means for generating and applying a pressure wave to said medium contained in said switch casing and spaced from said switch contacts;

wherein said pressure wave travels through said medium from said blasting cap means to said first and second switch contacts, and being subject to said pressure wave at least one of said first and second switch contacts collapses thereby electrically disconnecting said first external connection from said second external connection.

4,345,128

ELECTRICAL CONTACT POSITIONING ASSEMBLY

Horace J. Buttner, 25222 Broadwell, Harbor City, Calif. 90710, and Thomas E. Buttner, 28134 Ridepoint Ct., Rancho Palos Verdes, Calif. 90274

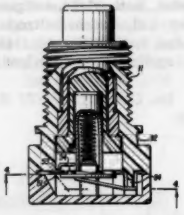
Filed May 15, 1980, Ser. No. 149,817
Int. Cl.³ H01H *3/12, 3/34*
U.S. Cl. 200—153 J **16 Claims**

1. An electrical switch assembly comprising: a first contact means movable between first and second stable positions spaced from one another within said switch assembly;

moving means for moving said first contact means between

said first and second stable positions, said moving means having the characteristic that its travel during the moving of said first contact means from said first stable position to said second stable position causes an extra motion of said first contact means beyond, followed by a return to, said second stable position;

a second contact means positioned to contact said first contact means in said second stable position and having a configuration including a deflectable portion initially extending at least in part in a plane lying generally across the line of travel of said first contact means between said first and second stable positions, whereby said movable



fist contact means contacts and deflects said deflectable portion while moving toward said second stable position;

a third contact means positioned for contacting said movable first contact means when said first contact means is in said first stable position; and,

stop means attached to said switch assembly and including a portion intersecting the line of travel of said deflectable portion for limiting the deflection of said deflectable portion in the direction toward said first stable position to ensure complete separation of said first and second contact means prior to said first contact means reaching said first stable position.

4,345,129

ELECTRICAL SWITCH

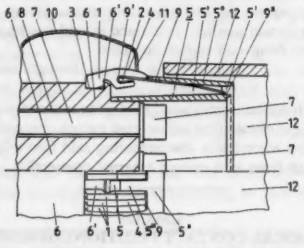
Franz Czech, Niederhasli; Gerhard Mauthe, Birmenstorf, and Hans Pfrötzschner, Wettingen, all of Switzerland, assignors to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Filed Mar. 19, 1980, Ser. No. 131,844

Claims priority, application Switzerland, Apr. 3, 1979, 3079/79

Int. Cl.³ H01H *1/38, 1/44*

U.S. Cl. 200—163 **15 Claims**



1. An electric switch comprising:

first and second conductors, at least one of said conductors having a central opening into which the other conductor is inserted during a circuit making operation so that said one conductor overlies said other conductor when the switch is in its circuit-making position;

a plurality of contact elements disposed between said first and second conductors when they are in the circuit-making position to electrically connect said conductors, each of said contact elements including a contact pin having one end disposed on one of said conductors, and a flat spring having one end operatively connected to the other end of said contact pin, said contact pin and spring forming a unit extending in the circuit making/breaking direction of movement of said conductors relative to one another; and

a cage member resiliently held in place on the conductor on which said contact pins are disposed by the other ends of said flat springs.

4,345,130

ELECTRICAL CONTACT

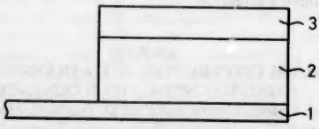
Tsutomu Okutomi, Yokohama; Masachika Iida, Kuwana; Kazuyoshi Kuwabara, Tama; Hisashi Yoshino, Yokohama, and Eiichi Takayanagi, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 3, 1980, Ser. No. 212,412

Claims priority, application Japan, Dec. 21, 1979, 54-165705

Int. Cl.³ H01H *1/02*

U.S. Cl. 200—268 **7 Claims**



1. An electrical contact which comprises an interrupting layer for interrupting a large short-circuit current in a circuit breaker consisting essentially of Cu-W alloy, Cu-WC alloy or Cu-W-WC alloy containing 20 to 60 wt % of Cu and being bonded to the top surface of a base plate, and a contacting layer consisting essentially of Ag-WC alloy, Ag-W alloy or Ag-W-WC alloy containing 20 to 60 wt % of Ag and being bonded to the top surface of said interrupting layer.

4,345,131

METHOD AND APPARATUS FOR ELECTRODE TOOL WEAR COMPENSATION

Georges Semon, and Alain Wavre, both of Geneva, Switzerland, assignors to Ateliers des Charmilles, S.A., Geneva, Switzerland

Filed Mar. 17, 1980, Ser. No. 130,618

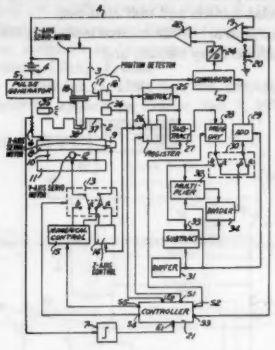
Claims priority, application Switzerland, Mar. 29, 1979, 2897/79

Int. Cl.³ B23P *1/14*

U.S. Cl. 219—69 G **6 Claims**

1. A process for controlling the depth of material removal by an electrode tool from an electrode workpiece in an EDM apparatus, wherein a machining pass is terminated when the electrode tool has penetrated into the workpiece to a pre-established reference position limit, said process comprising bringing said electrode tool prior to effecting a machining pass to a first position whereby one of the active surfaces of the electrode tool reaches a reference location, recording the parameter of said first position, effecting said machining pass to said pre-established reference position limit, subsequently bringing said electrode tool prior to effecting a second machining pass to a second position whereby said active surface of said electrode tool reaches said reference location, recording the parameter of said second position, determining the amount of wear of said electrode tool as a difference between the parame-

ters of said first and second positions, and adjusting the reference position limit in the course of a subsequent machining pass



as a function of the difference between the parameters of said first and second positions.

4,345,132

COOKING APPARATUS

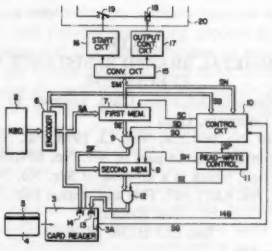
Akio Takase; Hiroshi Horikoshi, and Toshio Kasada, all of Ojima, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1979, Ser. No. 98,442

Claims priority, application Japan, Dec. 1, 1978, 53/166185[U]; Dec. 1, 1978, 53/166186[U]; Jan. 16, 1979, 54/3705

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—10.55 B **4 Claims**



1. A cooking apparatus for performing cooking in accordance with cooking control data supplied thereto by input means comprising:

(a) first and second input means comprising a keyboard for providing cooking control data and a card reader for reading data from a magnetic card;

(b) first memory means for temporarily storing input data from said first and second input means;

(c) second memory means for storing data applied thereto from said first memory means as data to be written exclusively onto said magnetic card;

(d) writing means for writing said data to be written exclusively onto said magnetic card in response to a predetermined signal; and

(e) control means for causing said writing means to perform data writing upon the presence of a data writing instruction signal from said keyboard, and for causing data to be read from said magnetic card when said data writing instruction signal is not present, and for causing transfer of data from said first memory means to said second memory means upon detection of the end of the cooking operation.

4,345,133

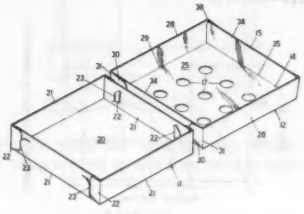
PARTIALLY SHIELDED MICROWAVE CARTON

Jerome A. Cherney, Appleton, and Thomas D. Pawlowski, Neenah, both of Wis., assignors to American Can Company, Greenwich, Conn.

Filed Mar. 12, 1980, Ser. No. 129,722

Int. Cl.³ H05B *6/64*

U.S. Cl. 219—10.55 E **11 Claims**



1. A carton adapted to partially shield the contents thereof from microwave radiation, comprising:

(a) a carton receptacle formed of paperboard without shielding, having a bottom panel and vertical side wall panels formed integrally therewith and extending upwardly therefrom, said side wall panels being connected together to form a continuous side wall about said bottom panel; and

(b) a carton cover separate from the receptacle disposed over said receptacle, including:

(1) a cover top panel formed of paperboard and having substantially the same size and shape as said receptacle bottom panel, and having side edges about the periphery thereof,

(2) paperboard cover wall panels integrally connected with and depending downwardly from the side edges of said cover top panel, said cover wall panels being connected together to form a continuous cover wall about said cover top panel,

(3) one entire surface of said cover top panel and of said cover wall panels having a layer of conductive metal in electrical continuity laminated thereto which is selected to substantially inhibit the passage of microwaves therethrough.

(4) means for providing a capacitive electrical connection between the conductive surfaces on adjacent cover wall panels forming said cover wall having low impedance at microwave frequencies, such that arcing between adjacent cover wall panels during microwave heating is inhibited,

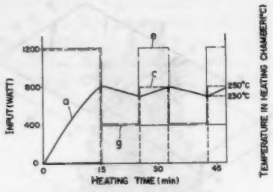
(5) the height of said cover wall panels being less than the height of said receptacle wall panels so that the bottom edges of the cover wall panels and laminated conductive metal layer will be spaced above the level of the bottom surface of the bottom panel a distance of at least approximately 1/16 inch to inhibit discoloration of the surface on which the bottom panel rests when the inside surface of the cover top panel rests on the top edges of the receptacle side wall panels and the carton is subjected to microwave radiation, and

(6) all corners formed in said cover wall panels which are in closest proximity to the level of said receptacle bottom panel being rounded to thereby minimize the electric field intensity at such corners.

4,345,134
HIGH FREQUENCY HEATING APPARATUS

Junzo Tanaka, Fujiidera, and Masatomo Orita, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP78/00043, § 371 Date Sep. 11, 1979, § 102(e) Date Sep. 11, 1979, PCT Pub. No. WO79/00562, PCT Pub. Date Aug. 23, 1979
PCT Filed Dec. 8, 1978, Ser. No. 154,418
Claims priority, application Japan, Jan. 30, 1978, 53/9732
Int. Cl.³ H05B 6/68
U.S. Cl. 219—10.55 B 2 Claims



1. In a high frequency heating apparatus including a heating chamber, a high frequency generator for radiating high frequency energy into said heating chamber, resistance heating means having low and high heating levels, and temperature detecting means for detecting the temperature within said heating chamber, the combination including

means for initially energizing said resistance heating means at said high heating level, said high frequency generator being deenergized;

means for energizing said high frequency generator and deenergizing said resistance heating means when said temperature detecting means senses that the temperature within said heating chamber has reached a first predetermined temperature, said high frequency generator being thereafter continuously energized; and

means for switching said resistance heating means to said low heating level when said temperature detecting means senses that the temperature within said heating chamber has decreased to a second predetermined temperature below said first predetermined temperature, said resistance heating means being thereafter intermittently energized at said low heating level when said temperature detecting means senses that the temperature within said heating chamber has decreased to said second predetermined temperature, the temperature within said heating chamber being thereby increased gradually to said first temperature and maintained between said first and second predetermined temperatures, the total input power to said high frequency generator and said resistance heating means being maintained within the electrical power capacity of said high frequency heating apparatus.

4,345,135
DELAY-START ARRANGEMENT FOR A MICROWAVE OVEN

Larry R. Harmon, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Nov. 28, 1980, Ser. No. 210,942
Int. Cl.³ H05B 6/68
U.S. Cl. 219—10.55 B 9 Claims

1. A microwave oven circuit adapted for coupling to a power source comprising:

a magnetron,

a duty cycle controlled switching element,

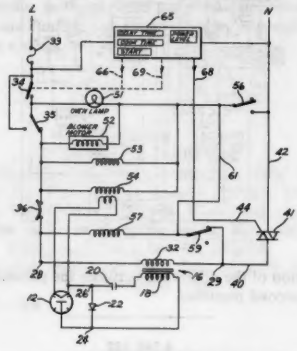
a first current path across said source including said duty cycle controlled switching element to periodically close said first current path to energize said magnetron,

a delay start relay including a first normally closed relay switch and a second normally open relay switch,

at least one electrical load adapted to be continuously energized from the power source during the cooking process,

a second current path across the source including said relay, said first relay switch and said element,

a third current path across the source including said one load and said second relay switch, and



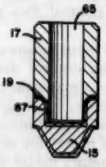
a fourth current path across the source including said relay and said second relay switch for providing a holding current to said relay after said first relay switch opens,

whereby said relay is energized in response to initial turn-on of said magnetron by said switching element to thereby close said second relay switch and energize said one load and open said first relay switch to electrically isolate said relay coil from said switching element.

4,345,136
COPPER BIMETAL BRAZED RESISTANCE WELDING ELECTRODE

Russell A. Nippert, Delaware, Ohio, assignor to The Nippert Company, Delaware, Ohio

Division of Ser. No. 960,224, Nov. 13, 1978, Pat. No. 4,288,024, which is a continuation-in-part of Ser. No. 844,899, Oct. 25, 1977, abandoned, which is a division of Ser. No. 749,983, Dec. 13, 1976, Pat. No. 4,071,947. This application Feb. 27, 1981, Ser. No. 238,901
Int. Cl.³ B23K 11/30
U.S. Cl. 219—120 4 Claims



1. A bimetal resistance welding electrode, comprising:

a dispersion strengthened copper tip portion formed of a copper-aluminum alloy which is internally oxidized and cold worked and having a coating of high conductivity copper on the upper surface thereof,

a full hard hollow, extruded shank portion of high conductivity copper, and

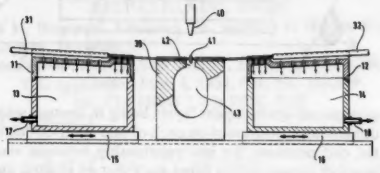
a brazed connection between said shank portion and said upper surface of said tip portion.

4,345,137

METHOD OF WELDING SEVERAL OPTICAL FIBERS END TO END IN LAYERS AND A DEVICE FOR WELDING IN ACCORDANCE WITH SAID METHOD

Georges Mignien, Mezieu, and Francis Gauthier, Eparvier, both of France, assignors to Compagnie Lyonnaise de Transmissions Optique, Clichy, France

Filed Jan. 3, 1980, Ser. No. 109,430
Claims priority, application France, Jan. 3, 1979, 79 00074
Int. Cl.³ B23K 9/00
U.S. Cl. 219—121 PK 1 Claim



1. A method of welding a plurality of optical fibers end to end in layers in a common vertical weld plane, each fiber including a bared portion and a covered portion, said method comprising the steps of:

(a) placing the covered portions of the fibers in parallel positioning grooves and the bared portions of the fibers in parallel positioning grooves for the bared portions of the fibers within supporting blocks, providing an opening in the neighborhood of the weld plane and a chamber for slowing down the gases of a microplasma with said chamber disposed below the opening and connected thereto;

(b) disposing a microplasma welding torch with a vertical axis in the common vertical weld plane and above the ends of the fibers, moving said welding torch in the weld plane;

(c) disposing a stop plate between the ends of the fibers;

(d) applying a relatively low vacuum pressure through the bottom of said parallel positioning grooves for said covered portions and said bared portions of said fibers and bringing the blocks closer to each other until the fibers press against the stop plate with said relatively low vacuum pressure allowing said fibers to slide on said supports;

(e) removing the stop plate and applying a higher relative vacuum pressure to said fibers through said parallel positioning grooves for said covered portions and for said bared portions of said fibers to securely clamp the fibers to said supports and bringing said blocks further closer together and the ends of the fibers closer until they come into contact end to end with each other;

(f) welding the ends of the fibers and terminating the vacuum pressure to said grooves to unclamp said fibers, and removing the welded fibers.

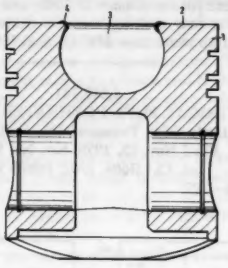
4,345,138

PROCESS OF SHAPING THE RIM OF A COMBUSTION CHAMBER RECESS OF A LIGHT-ALLOY PISTON

Wolf U. Zammert, Neckarsulm, Fed. Rep. of Germany, assignor to Karl Schmidt GmbH, Neckarsulm, Fed. Rep. of Germany

Filed Nov. 24, 1980, Ser. No. 210,116
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1979, 2948057
Int. Cl.³ B23K 27/00
U.S. Cl. 219—121 LF 7 Claims

1. In a process of shaping the edge of a combustion chamber recess in the piston head of a finish-machined light-alloy piston by applying an oscillating charged carrier beam to the edge of said combustion zone to remelt the same, the improvement wherein, after said piston is machine finished, applying an oscillating charged carrier beam to the edge of said recess such that said oscillating charged carrier beam forms an angle of inclination with said edge of 40° to 50°, causing said charged carrier beam to act on that portion of the rim of the combustion



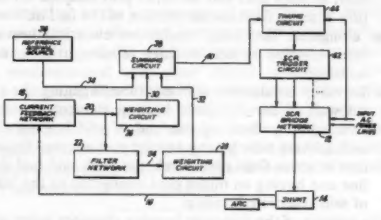
chamber recess to remelt the same, the rays of said charged carrier beam being applied to said edge portion only once.

4,345,139

CONSTANT CURRENT SCR POWER SUPPLY METHOD AND SYSTEM FOR A WELDING LOAD

Philip K. Higgins, Florence, S.C., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 30, 1980, Ser. No. 221,507
Int. Cl.³ B23K 9/10
U.S. Cl. 219—137 PS 8 Claims



8. A method for regulating the flow of constant current from an input AC power line to an arc by an SCR power supply interposed in series between the arc and the AC power line comprising the steps of: monitoring the arc to detect arc current perturbations; generating a first feedback signal proportional to arc current which substantially coincides in time and phase with the arc current; generating a second feedback signal proportional to arc current; passing the second feedback signal through a filter network having a relatively long time constant such that the second feedback signal, is rendered substantially nonresponsive to the arc current fundamental ripple frequency; weighing the first and second feedback signals in a predetermined ratio relative to one another; generating an error feedback control signal representing the weighted output of said first and second feedback signals and controlling the firing of said SCR power supply in timed synchronism with the input AC power line as a function of said error feedback control signal.

4,345,140

COMPOSITE WIRE FOR STAINLESS STEEL WELDING

Tomokazu Godai; Shoji Minato, both of Kamakura; Katushi Nishimura, Fujisawa, and Tsuneshi Ogawa, Kamakura, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Jun. 19, 1980, Ser. No. 160,930
Claims priority, application Japan, Jun. 22, 1979, 54-79547
Int. Cl.³ B23K 35/362
U.S. Cl. 219—146.23 7 Claims

1. A composite wire containing a flux for use in gas-shielded

arc welding of stainless steels, wherein said flux contains the following inorganic components with respect to the total weight of said wire:

0.1% ≦ anhydrous silicate ≦ 10%; and

0.01% ≦ a low melting metallic oxide having a melting point of no more than 888° C. ≦ 0.75%.

4,345,141

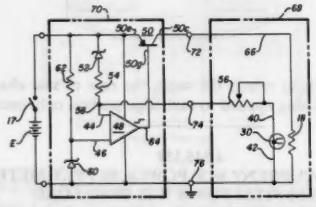
ELECTRICAL FUEL PREHEATER ASSEMBLY

William D. Little, 3548 Townsend Dr., Dallas, Tex. 75229

Filed Nov. 15, 1979, Ser. No. 94,731

Int. Cl.³ B60L *1/02*; H05B *1/02*

U.S. Cl. 219—207 **1 Claim**



1. An electrical fuel preheater assembly for use in combination with a fuel delivery line comprising, in combination:

a housing having an interior chamber defining a fuel reservoir, an inlet port and an outlet port adapted for connection in series fluid circuit relation to the fuel delivery line;

an elongated, thermally conductive electrical heating element coupled in heat transfer relation to said reservoir housing;

a thermally conductive delivery tube engaging the exterior sidewall of the elongated heating element in a multiple turn, spiral path along one end of said heating element, said delivery tube having an inlet port adapted for connection in series fluid circuit relation with said fuel delivery line and having an outlet port connected to the inlet port of said reservoir housing;

the volume of the reservoir housing chamber being substantially greater than the volume of the spiral delivery tube segment around said heater element;

a thermocouple sensor having an immersion probe received within the reservoir housing chamber for sensing the temperature of fuel in the reservoir; and,

circuit control means coupled to the thermocouple sensor and to the electrical heating element for interrupting the flow of electrical current from a power source to said heating element in response to the temperature of fuel in the sensor housing reservoir rising above a predetermined level.

4,345,142

DIRECTLY HEATABLE SEMICONDUCTOR TUBULAR BODIES

Wolfgang Dietze, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Division of Ser. No. 745,227, Nov. 26, 1976, abandoned. This application Oct. 11, 1978, Ser. No. 950,452

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1975, 2554399

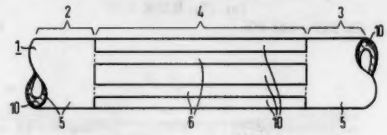
Int. Cl.³ F27B *5/14*; H05B *3/10*; H01C *1/14*

U.S. Cl. 219—390 **2 Claims**

1. A directly heatable seimconductor tubular body comprising:

a cylindrical tube comprised of a relatively pure semiconductor material selected from a group consisting of silicon and silicon carbide, said tube having at least an inner surface composed of said relatively pure semiconductor material and having a pair of outer circumferential end portions and an outer circumferential center portion extending between respective ones of said pair of end portions;

at least one layer of a dopant positioned on each one of said outer circumferential end portions; and

a plurality of circumferentially spaced apart dopant layers on said outer circumferential center portion, each one of

said spaced apart dopant layers being in contact with said dopant layer positioned on each of said outer circumferential end portions, the interrelationship between such respective dopant layers being such that an electric current applied to one outer circumferential end portion of said tube is conducted through such dopant layers to the other outer circumferential end portion of said tube for directly heating said body.

4,345,143

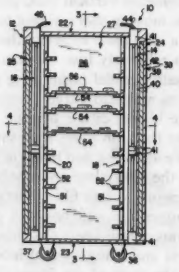
FOOD WARMING AND COOKING CABINET

Ernest M. Craig, and John M. Minor, both of Richmond, Va., assignors to Golden Skillet Corporation, Richmond, Va.

Filed Jun. 19, 1980, Ser. No. 160,994

Int. Cl.³ H05B *9/00*

U.S. Cl. 219—411 **2 Claims**



1. A food warming and cooking cabinet comprising:

a housing having interconnected side walls, a rear wall and a forward wall having an access opening therein;

a manually operable door connected to said housing and adapted to close said access opening;

said side walls and said rear wall having polished aluminum interior surfaces which surround and define an interior chamber to which access is obtainable through said access opening when said door is opened;

a pair of tubular infrared lamps disposed in said chamber adjacent said side walls;

each of said side walls having a vertically extending central concave recess formed therein;

one of said lamps being disposed in each of said recesses;

a pair of vertical support walls disposed within said chamber in spaced parallel relation to said side walls;

each of said lamps being disposed between a side wall and an adjacent support wall;

said support walls having a plurality of vertically spaced apertures therein and having inwardly directed horizontal flanges beneath said apertures;

said flanges being adapted to receive and support trays upon which food can be placed for warming or cooking;

an electrical power supply connected to said lamps; and

adjustable power regulator means connected with said power supply and said lamps for controlling the length of time said lamps are activated;

said lamps, when activated, providing infrared radiation which projects through said apertures to warm or cook food placed within said chamber upon said support trays.

4,345,144

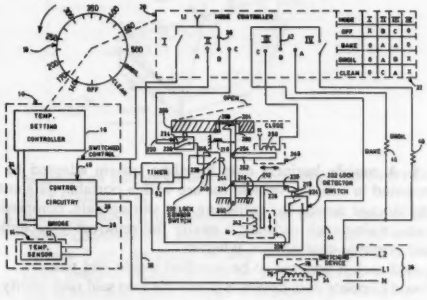
SAFETY LATCH CONTROL ARRANGEMENT FOR SELF-CLEANING OVEN

Frank H. Bergquist, Elmhurst, Ill., assignor to Harper-Wyman Company, Hinsdale, Ill.

Division of Ser. No. 113,734, Jan. 21, 1980, Pat. No. 4,340,806. This application May 4, 1981, Ser. No. 259,849

Int. Cl.³ H05B *1/02*; F24C *7/08*

U.S. Cl. 219—413 **11 Claims**



1. An interlock arrangement for a self-cleaning oven having a frame defining an oven cavity, an oven door movably mounted with respect to the frame and movable between open and closed positions, oven cavity heat generating apparatus, an oven mode and temperature selector arrangement, and a temperature control arrangement responsive to the oven mode and temperature selector arrangement for controlling operation of the heat generating apparatus, said interlock arrangement comprising:

oven door locking means carried by the oven frame and comprising an elongated locking member having a door engaging portion at one extreme end of said locking member, said locking member being movable between a door unlocked position and a door locked position;

means carried by the oven door and adapted for cooperative engagement by said locking member; and

locking control means for controlling operation of said oven door locking means,

said oven door locking means further comprising means for latching said locking member to said unlocked door position when said locking member is positioned to said unlocked door position,

said locking control means comprising first actuating means for releasing said locking member from said latched unlocked door position and second actuating means for moving said locking member from said locked door position to said unlocked door position, said first actuating means comprising means for biasing said control member to said locked door position when said locking member is released from said latched unlocked position,

said locking control means further comprising switch verification means responsive to and being directly engaged by said locking member and the oven door for providing a closed circuit path when the oven door is closed and said locking member is not in said locked door position and for providing an open circuit path when the oven door is opened or the locking member is in said door locking position, the oven mode and temperature selector arrangement being responsive to a predetermined clean mode setting to provide an electrical energizing supply to said switch verification means, said switch verification means being connected in series connection with said electrical energizing supply and said first actuating means,

said first actuating means being energized through said switch verification means to release said locking member from said latched unlocked door position when the oven mode and temperature selector arrangement is set to the clean mode, said oven door is in the closed position and said locking member is not in said door locked position,

said first actuating means being de-energized when said locking member moves to said door locked position in response to said switch verification means being in said open circuit path condition,

said oven mode and temperature selector arrangement further being responsive to a predetermined door unlock mode setting to connect an electrical energizing switched supply line to said second actuating means,

said locking control means further comprising latch verification switch means being responsive to said locking member being in said latched unlocked position for providing an open circuit path when said locking member is in said latched unlocked position, the oven mode and temperature selector arrangement further being responsive when set to the predetermined door unlock mode to provide an electrical energizing supply through said latch verification switch means to energize the temperature control arrangement, the temperature control arrangement being responsive to the oven mode and temperature selector arrangement being in the predetermined unlock door mode to provide on said electrical energizing switched supply line an energizing signal when the oven temperature is below a predetermined oven door unlock temperature and a de-energizing signal when the oven temperature is above said predetermined oven door unlock temperature, said second actuating means being responsive to the energizing signal on said electrical energizing switched supply line to move said locking member from said locked door position to said unlocked door position.

4,345,145

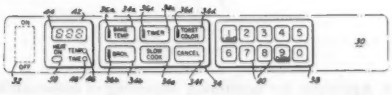
USER PROGRAMMABLE CONTROL SYSTEM FOR TOASTER OVEN APPLIANCE

Richard L. Norwood, Waterbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed May 19, 1980, Ser. No. 151,535

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—492 **28 Claims**



1. A countertop toaster oven appliance capable of performing the functions of TOAST, BAKE and BROIL, comprising:

(a) a compartment in which the food items to be heated are placed;

(b) heating elements for heating said compartment;

(c) sensing means for sensing the temperature within said compartment externally to the food items to be heated;

(d) a keyboard having a plurality of user actuatable keys including a plurality of numeric and function entry keys for entering numerical and functional data and for selecting one of a plurality of modes of operation;

(e) display means for displaying numerical and functional operating data;

(f) heater control means for controlling said heating elements;

(g) function selection means connected to said keyboard for establishing a set of control parameters for each selected mode of operation;

(h) heat requirement-determining means connected to said sensing means and to said function selection means for determining the heat input requirements into said compartment to satisfy the predetermined relationships for each selected mode of operation and for controlling said heater control means as a function of the actual temperature in said compartment and the temperature and mode of operation selected on said keyboard; and

(i) an interactive data entry means connected to said function selection means and to said display means for activating said display means with a signal indicating the type of numerical data to be entered before said numerical data is entered and displaying the numerical data as it is entered.

4,345,146

APPARATUS AND METHOD FOR AN ELECTRONIC IDENTIFICATION, ACTUATION AND RECORDING SYSTEM

James R. Story, 13380 SW. 82 St., Miami, Fla. 33183, and Joseph J. Sobodowski, IV, 13020 SW. 112 Ave., Miami, Fla. 33176

Filed Mar. 25, 1980, Ser. No. 133,946
Int. Cl.³ G07F *7/08*
U.S. Cl. 235—381 **17 Claims**

1. Apparatus for monitoring dispensing of commodities to a commodity receiver comprising in combination:

passive identification means having a secret code unique to a particular commodity receiver;

means for covering the secret code;

means for securing the passive identification means to the commodity receiver;

means for deciphering the secret code unique to the particular commodity receiver;

R.F. means for transmitting the deciphered code as a R.F. signal;

means for receiving the R.F. signal including the deciphered code, and

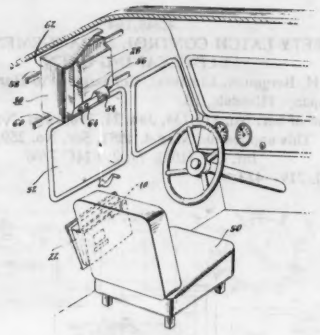
means associated with the receiving means for relating the deciphered code to the amount of commodity dispensed to the particular receiver.

4,345,147

VEHICLE MOUNTED MOBILE BUSINESS DATA HANDLING SYSTEM

Robert L. Aaron, Torrance, Calif., and Eugene F. Murphy, Ho Ho Kus, N.J., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 14, 1980, Ser. No. 206,783
Int. Cl.³ G06F *15/02*; G06K *7/14*
U.S. Cl. 235—385 **12 Claims**



1. A mobile business data handling system adapted to be mounted in a motor vehicle for use with a portable data entry and storage device for gathering and storing data, comprising a containing rack defining a cavity for removably accepting said portable data device, wherein

said rack is adapted to be attached inside said vehicle,

said portable data device is insertable into said rack cavity to an inserted position,

said rack has a quick-disconnect connector within said rack cavity for automatic connection of said connector with a mating connector on said portable data device when said portable data device is in said inserted position in said rack cavity,

said quick-disconnect connector in said rack cavity is arranged for connection to the vehicle power system to supply power to said portable data device and for connection to a data printer to receive and print data from said portable data device when said device is in said inserted position in said rack cavity, and

said rack cavity has guide means therein for positioning said portable data device in said rack cavity to align the connector on said portable data device with said quick-disconnect connector in said rack cavity to assure automatic mating and connection of said connectors when said portable data device is in said inserted position in said rack cavity.

4,345,148

AUTOMATIC RESPONSIVITY CONTROL FOR A CCD IMAGER

Michael Y. Pines, Los Angeles; Colin G. Whitney, Woodland Hills, and James S. Duncan, Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 6, 1980, Ser. No. 194,204
Int. Cl.³ H01J *40/14*
U.S. Cl. 250—214 C **14 Claims**

1. In a charge coupled device (CCD) focal plane array of photodetectors formed on a semiconductive substrate which is optically scanned and retraced over a field of view to generate image signal charge packets during the optical scanning and to generate first and second reference level charge packets during the optical retracing, a circuit for automatically compensating for deviations in optical responsivity among the photodetectors, comprising:

a CCD main channel disposed in said substrate so as to receive said image charge packets and said first and second reference level charge packets;

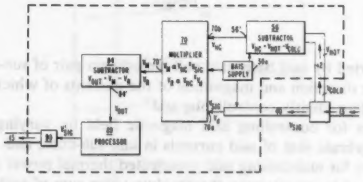
a CCD retrace channel in said substrate;

a clocked retrace electrode positioned so as to divert said reference level charge packets from said main channel into said retrace channel;

charge coupled floating sensor means in said main channel periodically reset to a first voltage V_1 for generating an image signal voltage V_{SIG} in response to each of said image signal charge packets;

charge coupled floating sensor means in said retrace channel for generating reference voltages V_{HOT} and V_{COLD} in response to said first and second reference level charge packets, respectively, during said optical retracing;

means for subtracting said reference voltages V_{HOT} and V_{COLD} from one another during said optical retracing to



establish an output voltage V_{HC} superimposed on a reference voltage V_O;

a multiplier having two inputs and an output, one of said inputs connected to receive said first substractor output voltage V_{HC}, the other of said inputs connected to said main channel charge sensor so as to generate a voltage V_M at said multiplier output which is proportional to the product $V_{SIG} \times V_{HC}$;

means for periodically holding said other multiplier output to a third voltage V_d so as to generate a voltage V_R at said multiplier output which is proportional to the product $V_d \times V_{HC}$;

means for subtracting said multiplier output voltages V_M and V_R to generate a difference voltage V_{OUT}, wherein the voltages V_O, V_1, and V_d are selected so as to minimize the contribution of said detector responsivity deviations to said output voltage V_{OUT}.

4,345,149

DISC-SHAPED CENTERING FIXTURE FOR OPTICAL ENCODERS

Anton J. Blaser, 700 E. Mason, Santa Barbara, Calif. 93103

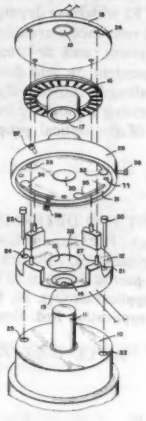
Filed Sep. 8, 1980, Ser. No. 185,145
Int. Cl.³ G01D 5/34
U.S. Cl. 250—231 SE **5 Claims**

1. An optical encoder assembly and centering fixture to be used on a motor shaft of given diameter, including, in combination:

(a) a mounting member having a circular periphery with a light source adjacent to a point on said periphery and having a central opening of larger size than said given diameter of said shaft of said motor so as to surround such shaft without touching the shaft and wherein the light source is positioned at a proper radial distance from the axis of said shaft for proper alignment with the remaining components of the assembly only when the mounting member is centered on the motor with said shaft extending through the central opening in exact concentric relationship with said circular periphery;

(b) a centering fixture comprising a disc-shaped element having a central bore of diameter corresponding to said given diameter of said shaft to receive said shaft in a friction fit, and a downwardly extending peripheral lip having an inside diameter corresponding to the outside diameter of said circular periphery of said mounting member

whereby when said shaft is received in said bore and said lip is coaxially positioned on said periphery of said mounting member, said mounting member is centered with its circular periphery precisely concentric with said shaft so that it may then be secured to said motor with assurance that it will be in proper alignment with the remaining components of said encoder assembly when the same are assembled after removing the centering fixture.

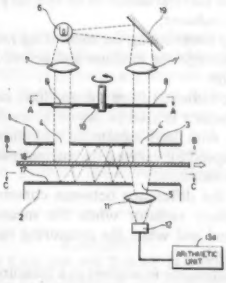


4,345,150

METHOD AND APPARATUS FOR MEASURING THE MOISTURE CONTENT OF PAPER

Hisashi Tamura; Naozo Taniguchi, and Hirotoshi Ishikawa, all of Tokyo, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed May 12, 1980, Ser. No. 148,808
Claims priority, application Japan, May 21, 1979, 54-63362
Int. Cl.³ G01J 1/00
U.S. Cl. 250—339 **4 Claims**



1. A method of measuring the moisture contained or absorbed in a sheet of paper by irradiating the sheet of paper with near infrared radiation having a first wavelength which is more absorbed by the moisture and a reference wavelength which is less absorbed by the moisture, detecting said first and reference wavelengths after the radiation has interacted with the paper, and processing signals indicative of the detected radiation in a predetermined arithmetic operation, wherein the improvement comprises the steps of:

providing first and second optical systems having different

path lengths between an irradiation aperture through which the sheet of paper can be irradiated with said near infrared radiation and an incident aperture through which the radiation having interacted with the sheet of paper can be received; and

processing in a predetermined arithmetic operation, detected signals Mt and Rt which are dependent on said first wavelength and said reference wavelength, respectively, in said first optical system, and detected signals Mn and Rn which are dependent on said first wavelength and said reference wavelength, respectively, in said second optical system, for deriving a moisture content signal free from the influence of the optical properties of the sheet of paper.

4,345,151

ARRANGEMENT FOR DETERMINING A MEDIUM

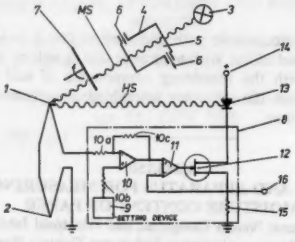
Ulrich Heim, Lübeck, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 107,279, Dec. 26, 1979, abandoned. This application Oct. 20, 1980, Ser. No. 198,819

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1978, 2856162

Int. Cl.³ G01J 1/00

U.S. Cl. 250—341 **11 Claims**



11. A method of determining a property of a medium which varies with the absorption of radiation in the medium, particularly a flowing medium comprising:

radiating a thermal sensor with a measuring radiation after the measuring radiation has passed through the medium;

exposing the thermal sensor to an auxiliary radiation from an auxiliary radiator;

periodically interrupting the measuring radiation after it has passed through the medium and before it strikes the thermal sensor;

varying the radiation from the auxiliary radiator so that the thermal sensor is always heated to a selected excess temperature with said measuring radiation interrupted and uninterrupted by varying the current passing through said auxiliary radiatior;

measuring the difference between current passing through the auxiliary radiator when the measuring radiation is interrupted and when the measuring radiation is uninterrupted; and

using the difference in current as a measure which is proportional to the property of the medium to be measured.

4,345,152

MAGNETIC LENS

Robert L. Gerlach, Minnetonka, Minn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Aug. 11, 1980, Ser. No. 176,735

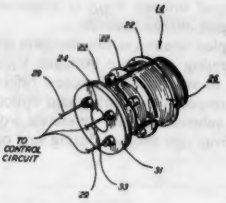
Int. Cl.³ H01J 3/14

U.S. Cl. 250—396 ML **6 Claims**

1. A magnetic lens useful in a charged particle beam generator comprising:

a base having an aperture therethrough, said aperture being axially aligned with the beam produced by said generator;

means, for producing a controllable magnetic field in said aperture of said base and simultaneously maintaining a preselected thermal power dissipation independent of the strength of said magnetic field, said means being an electromagnetic coil concentric with said aperture and supported by said base; said coil including a pair of sub-coils the direction and magnitude of the currents of which are independently controllable; and



means for controlling said magnetic field by varying the algebraic sum of said currents in said sub-coils; and

means for maintaining said preselected thermal power dissipated by maintaining the absolute value sum of said currents constant.

4,345,153

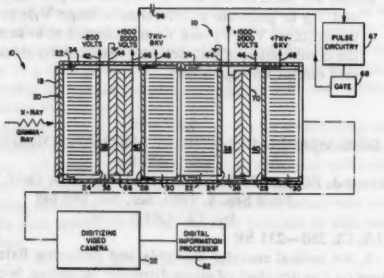
LOW INTENSITY X-RAY AND GAMMA-RAY SPECTROMETER

Lo I. Yin, Silver Spring, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 30, 1980, Ser. No. 173,524

Int. Cl.³ G01T 1/20

U.S. Cl. 250—369 **33 Claims**



1. Apparatus for imaging, counting, and energy resolving of single invisible radiation particles comprising:

means for converting said invisible radiation particles to visible light photons;

means for converting said visible light photons to photoelectrons;

means for light coupling each of said converting means;

means for intensifying said photoelectrons by an average gain factor of substantially 10^4–10^7, said intensifying means being an anti-ion feedback microchannel plate multiplier operated substantially below saturation;

means for displaying said intensified photoelectrons, said displaying means quantitatively indicating spatial position, number, and energy of said single invisible radiation particles.

4,345,154

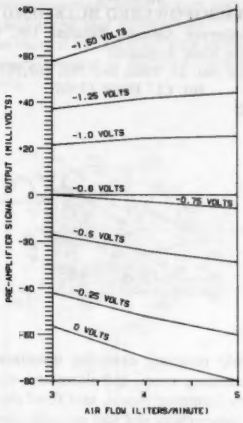
BIAS-COMPENSATED, IONIZATION SENSOR FOR GASEOUS MEDIA AND METHOD FOR ATTAINING PROPER BIAS FOR SAME

Augustus S. Bainbridge, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 3,436, Jan. 12, 1979, abandoned. This application May 18, 1981, Ser. No. 264,873

Int. Cl.³ H01J *39/28*

U.S. Cl. 250—375 **19 Claims**



1. For use with an ionization detector for monitoring gaseous media and detecting the presence of undesirable constituents therein, the combination comprising:

an ionization sensor cell for receiving a flow of sampled gaseous media therein and continuously sensing the ionization level thereof and for emitting electrical output voltage variations proportionate in voltage value to the levels of ionization sensed in the gaseous media, said cell being sensitive and responsive to variations in the rate of flow of the gaseous media being received therein and in consequence of such sensitivity and responsiveness thereby also emitting output voltage variations resulting from variations in the rate of flow of the gaseous media; and

means for compensating for variations in the electrical output voltage emitted by said sensor cell as a result of variations in the rate of flow of the gaseous media being sensed by said cell, said compensating means including voltage biasing means for impressing a bias voltage upon the output voltage of said cell of sufficient extent to nullify output voltage variations emitted by said cell as a consequence of variations in the flow rate of the gaseous media being sensed by said cell.

4,345,155

RADIATION DETECTOR FOR USE IN X-RAY TOMOGRAPHY

Robert Allemand, St. Ismier, and Michel Laval, St. Martin d'Uriage, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

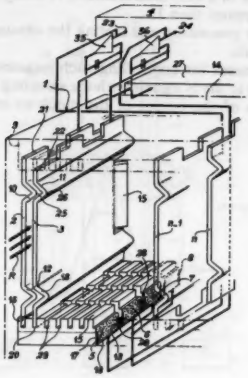
Filed Oct. 3, 1979, Ser. No. 81,431

Claims priority, application France, Oct. 13, 1978, 78 29267

Int. Cl.³ G01T *1/18*

U.S. Cl. 250—385 **6 Claims**

1. A radiation detector comprising an ionization chamber having at least two juxtaposed electrodes, formed by plates respectively raised to a first potential and to a second potential, said plates being supported by insulating strips, wherein the



plates form in the vicinity of the insulating strips baffles which protect the strips against radiation.

4,345,156

IONIZATION CHAMBER TYPE X-RAY DETECTOR

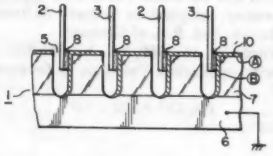
Isao Ishikawa, Hino; Hiroshi Kanda, Tokorozawa, and Shinji Yamamoto, Hachioji, all of Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan

Filed Oct. 7, 1980, Ser. No. 194,817

Claims priority, application Japan, Oct. 8, 1979, 54-128941

Int. Cl.³ G01T *1/18*; G01N *21/00*

U.S. Cl. 250—385 **7 Claims**



1. An ionization chamber type X-ray detector comprising:

a pair of electrode supporting plates each having a surface in which a plurality of grooves are formed with a predetermined interval from each other, that surface portion of said electrode supporting plates between said grooves being made of non-insulative material; and

a plurality of plate-like anode and cathode electrodes secured to said grooves respectively through insulating medium.

4,345,157

PROCESS FOR USE OF AN X-RAY TOMO-SCANNER MAKING IT POSSIBLE TO PERFORM CINEDENSIGRAPHY AND CORRESPONDING ADAPTATION OF TOMO-SCANNER

Remy Klausz, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jul. 14, 1980, Ser. No. 168,105

Claims priority, application France, Jul. 17, 1979, 79 18463

Int. Cl.³ A61B *6/00*

U.S. Cl. 378—19 **11 Claims**

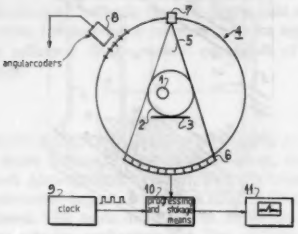
1. An X-ray tomo-scanner comprising:

a radiation absorption measuring device supplying N signals corresponding to the absorption undergone respectively

by N elementary beams while passing through a section to be examined and defining a projection of said section at the time of a first measurement, N being an integer equal to or greater than 1;

means for processing and storing the obtained sequences of N signals;

a clock means for controlling each measurement operation leading to the N signals with the sampling occurring at the rhythm of the output of the clock to indicate different



states of said section observed with said clock signals being supplied whenever the tomo-scanner is used in cinedensigraphy to the processing and storage means in place of the signals, which, when used in tomo-scanning, indicate the angular position of the measuring device; and

visual display means for displaying the amplitude of the sequences of N signals obtained as a function of time for one or more given elementary beams and/or at a constant time for the different elementary beams.

4,345,158

TOMOGRAPHIC APPARATUS FOR THE PRODUCTION OF TRANSVERSE LAYER IMAGES

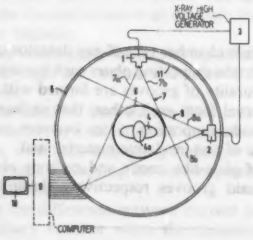
Manfred Pfeiler, and Karlheinz Pauli, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 14, 1980, Ser. No. 196,530

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1979, 2943643

Int. Cl.³ A61B *6/00*

U.S. Cl. 378—5 **2 Claims**



1. Tomographic apparatus for the production of transverse layer images of a radiography subject, comprising a radiation measuring arrangement having two radiation sources of different radiation energy, which generate radiation beams penetrating the radiography subject, the cross-sectional extent of said radiation beams perpendicular to the layer plane being essentially equal to the layer thickness, and also having a radiation receiver which determines the radiation intensity behind the subject, a rotating device for irradiation of the radiography subject from different directions, and a computer for the determination of the attenuation coefficients of every image point in an image point-matrix disposed in the examined layer, the computer being so designed that, for every image point, it determines the attenuation coefficient for every radiation energy and determines therefrom the median ordinate value and the density, characterized in that the radiation receiver (5), as a stationary ring, is comprised of a plurality of detector elements, and that, for scanning, only the radiation sources (1, 2) are rotated about the radiography subject (4) and that the radiation sources (1, 2) are maintained at such a distance from one another that no detector element is simultaneously impinged upon by both radiation beams (7, 8).

4,345,159

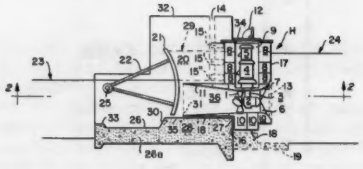
HYDROPOWERED BULKHEAD

Francisco J. Gutierrez Atencio, Estafeta Dr., Garcia 3101, Diamante Entre Rios, Argentina

Filed Jul. 15, 1980, Ser. No. 169,185

Int. Cl.³ F03B *13/08*

U.S. Cl. 290—43 **13 Claims**



1. A fluid body retaining damming installation including, fixed primary damming means and alternative complementary movable primary damming means, said fixed damming means defining a fluid passageway and said movable damming means controlling fluid flow therethrough, displaceable secondary damming means including a hydropowered bulkhead assembly having a conduit provided with a peripheral wall defining a fluid flow path through said assembly, said conduit having a first fluid intake open end and a second fluid exhaust open end, an energy generation unit within said assembly having motive means within said conduit adapted to be moved by fluid flowing through said conduit to actuate said energy generation unit, at least one said open end of said assembly conduit insertable within said fluid passageway in a juxtaposed manner to provide an energetic functional status therewithin, said hydropowered bulkhead assembly having displacement means therein operable to selectively displace said assembly and its secondary damming means between a first extreme position in said juxtaposed energetic functional status and a second extreme position with said assembly in an idle non-operative status fully removed from juxtaposed said fluid passageway, said displacement means including a plurality of selectively operable hermetic chambers and ballast means defining buoyancy of a volume at least sufficient to produce a spatial-controlled flotation or sinking status on said bulkhead assembly when gas or liquid is respectively admitted therein for achieving said displacement between said two extreme defined positions, and said hermetic chambers and ballast means optionally/alternatively operable to induce an angular rotation of said bulkhead assembly substantially about the horizontal axis of said conduit.

4,345,160

WATERWHEEL POWER GENERATOR

J. T. Smith, 225D Forrest Ave., Gainesville, Ga. 30501

Continuation of Ser. No. 949,198, Oct. 6, 1978. This application Dec. 10, 1980, Ser. No. 214,708

Int. Cl.³ F03B *7/00*

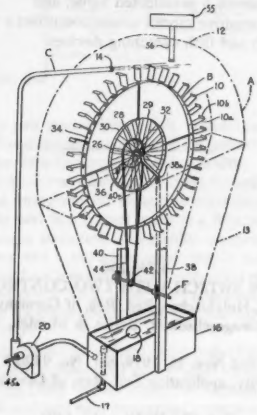
U.S. Cl. 290—52 **5 Claims**

1. Power generating apparatus comprising:

a housing enclosure;

a waterwheel carried within said housing enclosure in an upright manner having a plurality of fin elements for

turning said waterwheel responsive to a discharge of water thereagainst;
said waterwheel including a shaft;
hub means carried on said shaft;
a rim member carried by said hub means carrying said fin elements;
means supporting said rim member on said hub means including adjustment means balancing and aligning said waterwheel so that said waterwheel may be maintained in rotational balance and alignment with said discharge means;
water discharge means enclosed within said housing enclosure disposed above said waterwheel;
nozzle means carried by said discharge means extended into said enclosure housing in discharge alignment with said fin elements;



said nozzle means including a generally cylindrical sidewall terminating perpendicularly in an end plate having a reduced central water discharge aperature formed therein affording abrupt water compaction at discharge facilitating discharge of a solid stream of water generally devoid of air;
a water collection tank disposed below said waterwheel integral with said housing enclosure affording collection of said water discharge from said water discharge means;
water control means for maintaining a desired level of water in said collection tank;
supply means for delivering water to said water discharge means; and
power take-off means connected to said waterwheel and adapted for connection to a power generator.

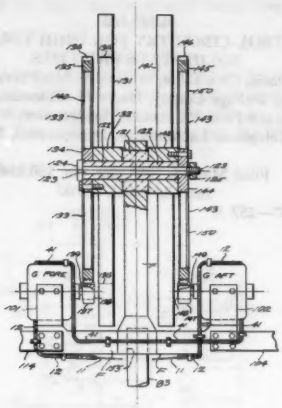
4,345,161

MULTI-WHEEL WINDMILL ELECTRO-GENERATOR

George Crompton, 710 S. Armada Rd., Venice, Fla. 33595

Filed Feb. 23, 1979, Ser. No. 14,904
Int. Cl.³ F03D *1/02*
U.S. Cl. 290—55 **2 Claims**

1. A wind wheel electro-generator having a plurality of wind wheels having fixed vanes,
said vanes balking the wind over the entire area swept by the vanes and widening with their radii,
said wind wheels being in fore and aft relationship,
individual electro-generators each mechanically geared to a particular wind wheel,
said electro-generators being mechanically independent of each other, and the volume outside the body of revolution defined by the peripheries of the wind wheels being unimpeded by any enclosure so that the wind stream can enter between the wheels thereby to increase the energy received,



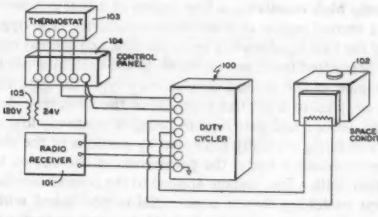
one of said wind wheels being counter rotative to another thereof.

4,345,162

METHOD AND APPARATUS FOR POWER LOAD SHEDDING

Jeffrey M. Hammer, St. Louis Park, and Thomas J. Olson, Richfield, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 30, 1980, Ser. No. 164,711
Int. Cl.³ H02J *13/00*
U.S. Cl. 307—39 **46 Claims**



1. A method of limiting the electrical power demand of electrical space conditioning means comprising the steps of:
sensing the ON and OFF half-cycle times of the thermostat means associated with operation of the space conditioning load means;
storing information related to said sensed ON and OFF half-cycle times;
initiating overriding control of the ON-OFF switching function of the space conditioning load means from said thermostat means at the inception of a load-shedding interval;
controlling the ON-OFF half-cycle times of the space-conditioning load during a load-shedding interval based on load-shed ON and OFF half-cycle times individually determined for that space conditioning load means derived from stored information and in a manner such that the thermostat state determines whether said space conditioning load means is ON during any part of each of said load-shed ON half-cycle times and said space conditioning means remains off during the load-shed OFF half-cycle regardless of thermostat state; and
returning full control of said ON-OFF switching means of

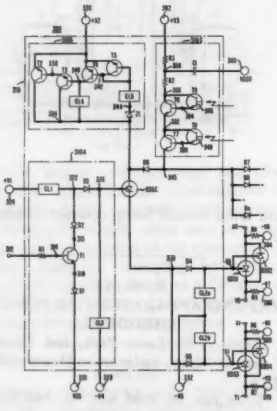
said space conditioning load means to said thermostat means after the load-shedding interval.

4,345,163

CONTROL CIRCUITRY FOR HIGH VOLTAGE SOLID-STATE SWITCHES

James A. Davis, Glen Ellyn; William F. MacPherson, Winfield Township, DuPage County; Harry E. Mussman, Glen Ellyn, all of Ill., and Peter W. Shackle, Bridgewater, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 15, 1980, Ser. No. 150,184
Int. Cl.³ H03K *17/60*
U.S. Cl. 307—252 A **3 Claims**



1. Circuitry for use with a first switching device of the type comprising a semiconductor body a bulk portion of which is of relatively high resistivity, a first region of a first conductivity type, a second region of a second conductivity type opposite that of the first conductivity type, the first and second regions being connected to output terminals of the switching device, a gate region of the second conductivity type, the gate region being coupled to a control terminal of the switching device, the first, second and gate regions being of relatively low resistivity and being mutually separated by portions of the bulk of the semiconductor body, the parameters of the device being such that, with a first voltage applied to the control terminal of the first switching device, a potential is established within a cross-sectional portion of the bulk of the semiconductor body which is substantially different from that of the potential of the first and second regions and which prevents current flow between the first and second regions, and that, with a second voltage applied to the control terminal of the first switching device and with appropriate voltages applied to the output terminals of the first switching device, a relatively low resistance current path is established between the first and second regions by dual carrier injection, a second switching device of the same type as said first switching device, a second output terminal of the second switching device being coupled to the control terminal of the first switching device, a first branch circuit being adapted to be coupled to a first potential source and being coupled to the second switching device for controlling conduction between the first and second regions thereof, comprising:

a second branch circuit coupled to the second switching device and being adapted to be coupled to a second potential source which has a lower potential than the first potential source;

the second branch circuit being adapted to supply up to a preselected maximum current level to the second switching device and then thereafter to reduce the current level to a lower level;

a third branch circuit coupled to the second switching device and being adapted to be coupled to a third potential source and further being adapted to supply a pulse of current to the second switching device;

the second circuit branch comprises a third switching device which has one output terminal coupled to the second switching device, a second output terminal adapted to be coupled to the second potential source, and which has a control terminal;

voltage sensitive circuit means coupled to the first and second output terminals and control terminal of the third switching device for sensing voltage across the output terminals of the third switching device and for biasing off said device if the potential across the output terminals thereof exceeds a preselected value; and

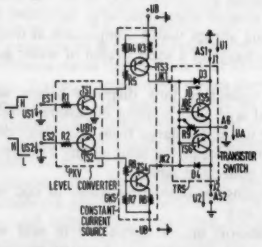
the voltage sensitive circuit means comprises a zener diode, and fourth and fifth switching devices.

4,345,164

TRANSISTOR SWITCH WITH TWO CONTROL INPUTS

Johannes Gies, Holzkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 16, 1979, Ser. No. 94,823
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1978, 2850653
Int. Cl.³ H03K *1/12, 3/01*
U.S. Cl. 307—255 **11 Claims**

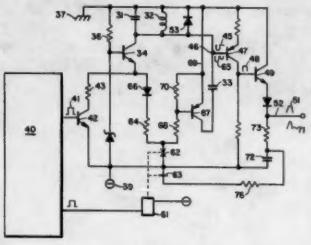


1. A transistor switch circuit, comprising: two control inputs respectively connected to two first transistors; two supply voltage sources of different polarity which are respectively supplied to a respective one of the transistors; outputs of the transistors respectively connecting to parallel connected base control inputs of two switching transistors; emitters of the switching transistors being connected to a common output; each of the collectors of the switching transistors being directly connected to a respective voltage source to be connected to the output by and through the respective switching transistor; and a first diode connected in parallel across the base-collector path of each of the two switching transistors, a polarity of the first diode being aligned to correspond to a polarity of the associated switching transistor base-collector path, whereby the switching transistors with the associated diodes provide a low resistance path from the respective voltage source to the output independent of load variations.

4,345,165
METHODS AND CIRCUITRY FOR VARYING A PULSE OUTPUT OF A RESONANT CIRCUIT

Leo L. Radke, Oklahoma City, Okla., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Sep. 22, 1980, Ser. No. 189,404
Int. Cl.[3] H03K *5/07*
U.S. Cl. 307—265 18 Claims

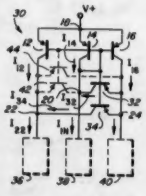


1. A pulse pair generating circuit, which comprises:
an inductive-capacitance network for generating a first output pulse of a first predetermined width;
a trigger circuit responsive to an input for applying a current pulse to energize said inductive-capacitance network to generate said first output pulse at a first point in time;
circuit means including a normally unoperated switching transistor and a capacitor connectable across the inductive-capacitance network upon operation of said transistor for controlling said inductive-capacitance network to produce a second output pulse of a second predetermined width; and
means responsive to a second input pulse for operating said switching transistor and said trigger circuit to apply an energizing pulse to said combined inductive-capacitance network and said now connected capacitor to produce an output pulse of said second predetermined width at a second point in time slightly delayed from said first point in time.

4,345,166
CURRENT SOURCE HAVING SATURATION PROTECTION

Gordon H. Allen, Mesa, and Robert A. Neidorff, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 28, 1979, Ser. No. 79,667
Int. Cl.[3] H03F *3/18*; H01L *29/72*
U.S. Cl. 307—296 R 9 Claims

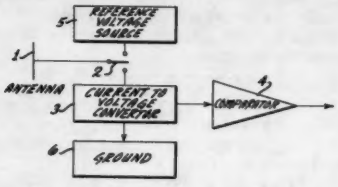


1. A current source for providing multiple output currents comprising an input transistor and at least two output transistors, the emitters of the input and output transistors being connected to a power supply terminal, the bases being commonly connected, the collector of the input transistor being connected with the base thereof to an utilization means, the collectors of the two output transistors being connected to respective load means, and additional utilization means being responsive to a first one of the output transistors becoming saturated for maintaining a balance of current between the input transistor and the second one of the output transistors, said additional utilization means being coupled to the base and collector of the first output transistor and to the respective collectors of the input and the second output transistor.

4,345,167
CAPACITANCE PROXIMITY SENSOR

Noel M. Calvin, 2683 Buena Vista, Berkeley, Calif. 94708

Continuation-in-part of Ser. No. 924,499, Jul. 14, 1978, abandoned. This application Jan. 18, 1980, Ser. No. 113,867
Int. Cl.[3] G08B *13/26*
U.S. Cl. 307—308 12 Claims

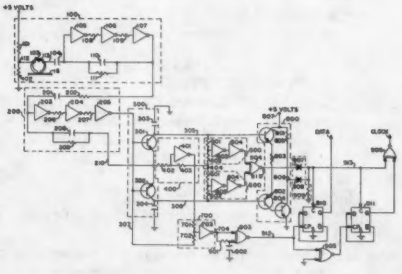


1. A method for detecting changes in the capacitance of an antenna caused by the approach of a person or object to the antenna comprising in combination the steps of:
charging said antenna to a fixed voltage relative to a reference body; discharging said antenna through a current to voltage convertor such that the output voltage of the convertor is proportional to the amount of charge stored on the antenna, performing said charging and discharging steps repetitively and in sequence; and
monitoring said output voltage to detect changes caused by the approach of a person or object to the antenna, which will increase the capacitance of the antenna, and hence increase the amount of stored charge.

4,345,168
ELECTRICAL PEAK DETECTOR

Alan J. Fisher, 5711 Tannahill Cir., Huntsville, Ala. 35802

Division of Ser. No. 13,907, Feb. 22, 1979, Pat. No. 4,254,441. This application Apr. 3, 1980, Ser. No. 136,839
Int. Cl.[3] H03K *5/153*
U.S. Cl. 307—351 3 Claims



1. A peak detector comprising:
signal means for providing an alternating potential between first and second terminals;
first and second bi-polar complementary transistors connected emitter-to-emitter, and thereby providing a common emitter terminal, and connected base-to-base, and thereby providing a common base terminal;
circuit means connecting said first terminal to said common base terminal;

a first capacitor connected in circuit between the collector of said first transistor and any constant potential, and a second capacitor connected in circuit between the collector of said second transistor and any constant potential point; and

feedback means connected between said common emitter terminal and said common base terminal, including capacitance means for coupling a capacitive effect between said common emitter terminal and said common base terminal;

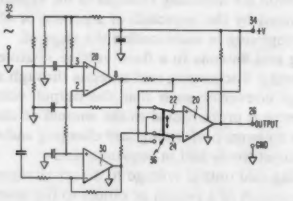
whereby, upon the application of a said alternating potential and thereby the operation of said transistors, said first and second capacitors are alternately charged to the respective peaks of a common emitter voltage through base-collector diodes of each transistor, and then each capacitor is partially discharged before the next peak of its charging potential by virtue of transistor action of quadrature phased emitter currents.

4,345,169

ZERO CROSSING DETECTOR

Mustafa Y. M. Saleh, Margate, Fla., assignor to Siemens Corporation, Iselin, N.J.

Filed Oct. 27, 1980, Ser. No. 201,007
Int. Cl.³ H03K *5/153;* G01R *19/175*
U.S. Cl. 307—354 **3 Claims**



1. Apparatus for detecting zero crossings of an electrical signal, said apparatus comprising, in combination:

(a) an input terminal for receiving the electrical signal;

(b) a voltage comparator having two inputs and an output;

(c) an inverting amplifier having an input and an output, said input thereof being coupled to said input terminal and said output thereof being coupled to one input of said voltage comparator; and

(d) a non-inverting amplifier having an input and an output, said input thereof being coupled to said input terminal and said output thereof being coupled to the other input of said voltage comparator.

4,345,170

CLOCKED IGFET LOGIC CIRCUIT

George P. Sampson, III, Bernardsville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 18, 1980, Ser. No. 178,901
Int. Cl.³ H03K *19/003, 19/096, 19/20, 17/16*
U.S. Cl. 307—443 **2 Claims**

1. A clocked logic circuit comprising:

means for providing a clock signal having a first and a second phase;

first and second terminals respectively connectable to receive a first and a second operating potential;

a plurality of input means for receiving respective input signals;

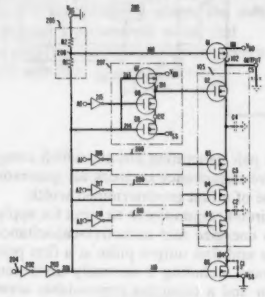
an output terminal for providing an output signal;

a first IGFET having a conduction channel coupled between the first terminal and the output terminal and a gate electrode;

means coupled to the gate electrode of the first IGFET and being responsive to the clock signal for biasing the first IGFET to the ON state during the second phase of the clock signal and for biasing the first IGFET to the OFF state or to have a relatively low channel conductance during the first phase of the clock signal;

a functional network coupled between the output terminal and a first node, the network comprising a plurality of IGFETs each having a gate electrode coupled to a respective one of the input means and a conduction channel, the conduction channels of the IGFETs of the functional network being coupled in a configuration to provide the circuit with a predetermined logical function, the configuration having two or more conduction channels coupled in series,

a second IGFET having a conduction channel coupled between the first node and the second terminal and a gate electrode;



means coupled to the gate electrode of the second IGFET and being responsive to the clock signal for biasing the second IGFET to the OFF state during the second phase of the clock signal and for biasing the second IGFET to the ON state during the first phase of the clock signal;

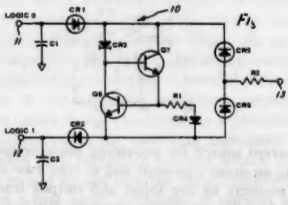
characterized in that the plurality of input means are responsive to the clock signal for providing the respective input signals to the gate electrodes of the IGFETs of the functional network during the first phase of the clock signal and for providing substantially the first operating potential to the gate electrodes of the IGFETs of the functional network during the second phase of the clock signal whereby noise at the output terminal is reduced.

4,345,171

ADAPTABLE NONLINEAR TRANSMISSION LINE TERMINATOR

William S. Harris, Jr., Austin, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 30, 1980, Ser. No. 164,379
Int. Cl.³ H03K *5/08;* H03H *7/40*
U.S. Cl. 307—560 **10 Claims**



1. An adaptable nonlinear transmission line terminator comprising:

(a) a "0" reference terminal upon which a voltage representing a logical "0" is impressed;

(b) a "1" reference terminal upon which a voltage representing a logical "1" is impressed;

(c) an input terminal upon which an input signal is impressed;

(d) current blocking circuitry for blocking current flow between the input terminal and either of the "0" or "1" reference terminals when the input signal voltage amplitude falls within the range defined by the "0" voltage and "1" voltage, presenting high impedance to the transmission line; and

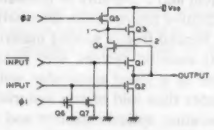
(e) impedance matching circuitry for reducing line reflection, connected to the current blocking circuitry, to match the impedance of the transmission line when the input signal voltage amplitude falls outside the range defined by the "0" voltage and the "1" voltage, thereby allowing current flow between the input terminal and either of the "0" or "1" reference terminal.

4,345,172

OUTPUT CIRCUIT

Satoru Kobayashi, and Hiroshi Watanabe, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1979, Ser. No. 93,263
Claims priority, application Japan, Nov. 14, 1978, 53-140352
Int. Cl.³ H03K *5/08, 19/092, 19/094, 19/017*
U.S. Cl. 307—562 **16 Claims**



1. An output circuit comprising a series circuit including first and second field-effect transistors connected in series between first and second nodes and an output node derived from a junction between said first and second transistors, said first and second transistors being controlled by at least one signal, a first power source, a third field-effect transistor provided between said first node and said first power source, and a control means responsive to a level of said output node for controlling a level at the gate electrode of said third transistor so as to limit a high level of said output in absolute value.

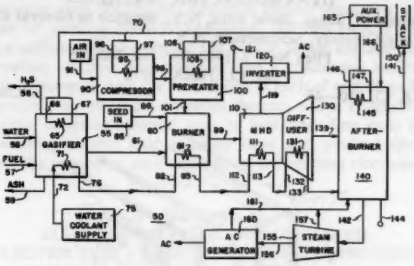
4,345,173

METHOD OF GENERATING ELECTRICITY USING AN ENDOTHERMIC COAL GASIFIER AND MHD GENERATOR

David D. Marchant, and John M. Lytle, both of Richland, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 12, 1980, Ser. No. 177,327
Int. Cl.³ H02N *4/02*
U.S. Cl. 310—11 **18 Claims**

1. A method of generating electrical power, comprising: introducing carbonaceous material and water to a gasifier, initiating and sustaining the endothermic reaction of carbon and water in the gasifier thereby providing a gasified stream free of ash containing carbon monoxide, hydrogen and nitrogen, passing the gasified stream and an ionizing seed material to a burner and there contacting the gasified stream with preheated air to burn the gasified stream thereby producing ionized combustion gases having a temperature greater than about 3600° F., accelerating the ionized combustion gases to a velocity greater than about 400 meters per econd, passing the accelerated ionized combustion gases through an MHD generator to generate DC power and thereafter through a diffuser to reduce the gas velocity, and passing the gases from the diffuser



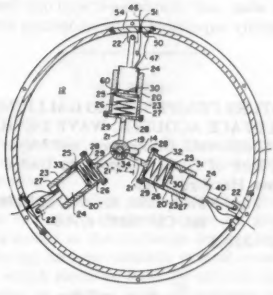
in heat exchange relationship with the gasifier to provide heat to sustain the endothermic reaction of carbon and water.

4,345,174

ELECTROMAGNETIC ENGINE

Neil H. Angus, Sebring, Fla., assignor to Angus Motor Corporation, Fort Lauderdale, Fla.

Filed Jun. 1, 1981, Ser. No. 269,332
Int. Cl.³ H02K *41/00*
U.S. Cl. 310—24 **19 Claims**



1. Electromagnetic apparatus for converting electrical energy into mechanical power comprising:

a support structure;

a crankshaft mounted on said support structure and arranged to rotate thereon;

at least one electromagnetic piston-cylinder combination comprising an electromagnetic piston pivotally attached to said support structure, a cylinder pivotally attached to a throw of said crankshaft and in sliding engagement with said piston, said piston being positioned within said cylinder;

an electrical power source for energizing said electromagnet; and

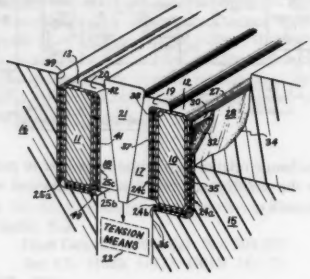
means for using substantially axial magnetic forces to impart axial motion to said cylinder which imparts rotational motion to said crankshaft.

4,345,175

MEANS FOR REDUCING SHEAR STRESSES ON WINDING CONDUCTOR INSULATION FOR AIR-GAP DYNAMOELECTRIC MACHINES

Donald W. Jones, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 3, 1980, Ser. No. 203,316
Int. Cl.[3] H02K 15/12
U.S. Cl. 310—45 21 Claims



1. In an air-gap dynamoelectric machine having a rotor rotatable about a longitudinal axis thereof and a stator magnetic core separated from said rotor by an air-gap, the combination comprising:

(a) a stator winding conductor having a layer of insulation thereon;

(b) stator winding conductor support means disposed in said air-gap in fixed relation to said stator magnetic core for supporting said conductor, said support means having at least one surface adjacent said conductor insulation;

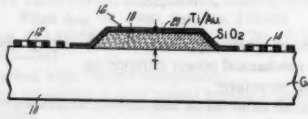
(c) an envelope disposed between said conductor insulation and said at least one surface, said envelope having a pair of interior, major, confronting surfaces slidable with respect to each other, and comprising at least one sheet of material substantially impervious to thermosetting resin.

4,345,176

TEMPERATURE COMPENSATED GALLIUM ARSENIDE SURFACE ACOUSTIC WAVE DEVICES

Thomas W. Grudkowski, Glastonbury, and Meyer Gilden, West Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 3, 1980, Ser. No. 203,178
Int. Cl.[3] H01L 41/08
U.S. Cl. 310—313 A 4 Claims



1. A temperature compensated surface acoustic wave device comprising a semi-insulating gallium arsenide substrate and at least one acoustoelectric transducer disposed on a surface of said substrate,

characterized by:

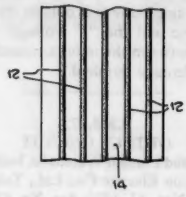
a composite mass loading and temperature compensating layer disposed on said surface, said layer including silicon dioxide and a metal having a Rayleigh wave velocity which is lower than the Rayleigh wave velocity of gallium arsenide.

4,345,177

LIGHT FIBERS MADE FROM COMPONENTS OF A TYPE II EUTECTIC SYSTEM

James D. Parsons, and Alfred S. Yue, both of Los Angeles, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 19,129, Mar. 9, 1979. This application Nov. 17, 1980, Ser. No. 207,143
Int. Cl.[3] H01J 40/02, 29/18; G02B 5/14
U.S. Cl. 313—95 13 Claims



1. An optical radiation conducting system comprising:

electro-magnetic conductive means for receiving and conducting optical radiation, said conductive means including a matrix material comprising a first component of a type II eutectic system and a plurality of mutually spaced optical energy conductive fibers within said matrix material, said fibers being formed from a second material component of said Type II eutectic system, said fiber material being characterized by a lesser molecular weight, but greater refractive index than said matrix material; and

means for generating optical radiation and supplying it to a first end of said fibers whereby said optical radiation is conducted through said fibers to a second end of said fibers.

4,345,178

HIGH INTENSITY REFLECTOR LAMP

John A. Pappas, Winthrop, and Roger T. Hebert, Peabody, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 865,616, Dec. 29, 1977, abandoned. This application Apr. 6, 1981, Ser. No. 251,661
Int. Cl.[3] H01J 61/35, 61/36
U.S. Cl. 313—113 2 Claims

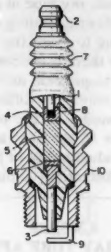
1. A reflector lamp comprising: an arc discharge tube disposed at about the focus of a parabolic reflector and supported by two lead-in support wires extending through the reflector and sealed to, and extending through and beyond, two ferrules which are glass to metal sealed to the reflector; a stabilizer support adhesively bonded to the back of the reflector, the external ends of the lead-in support wires being directly secured in the stabilizer support in order to stabilize the arc tube during vibration.

4,345,179

RESISTOR GLASS SEAL SPARK PLUG

Tadamichi Asai, and Kousuke Nakamura, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 10, 1980, Ser. No. 167,450
Claims priority, application Japan, Jul. 13, 1979, 54-88286
Int. Cl.³ H01T *13/20*
U.S. Cl. 313—136 6 Claims



1. In a resistor glass seal spark plug having between a terminal screw and a center electrode an electrical conductive glass seal at the side of the lower end of the terminal screw, a resistor glass seal and an electrical conductive glass seal at the side of the center electrode, the improvement wherein the electrical conductive glass seal at least at the side of the lower end of the terminal screw comprises carbon, one or more metals and glass.

4,345,180

ENVELOPE FOR METAL HALIDE DISCHARGE LAMP WITH PROTECTIVE LAYER CONTAINING B_2O_3

Hartmut Schneider, Munich, and Josef Grabmaier, Berg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 1, 1980, Ser. No. 117,550
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1979, 2906038
Int. Cl.³ H01J *61/35*
U.S. Cl. 313—221 5 Claims

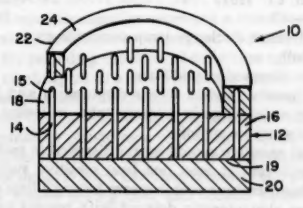
1. In a metal halide electric discharge lamp envelope composed of silica glass with a SiO_2-B_2O_3 glass layer on an inner wall thereof, the improvement comprising wherein said SiO_2-B_2O_3glass layer is covered with a protective layer comprised of a silica glass having a lower B_2O_3 content relative to the B_2O_3 content in said SiO_2-B_2O_3 glass layer.

4,345,181

EDGE EFFECT ELIMINATION AND BEAM FORMING DESIGNS FOR FIELD EMITTING ARRAYS

Joe Shelton, 700 Tatom St., SW., Huntsville, Ala. 35805

Filed Jun. 2, 1980, Ser. No. 155,890
Int. Cl.³ H01J *1/02*
U.S. Cl. 313—309 7 Claims



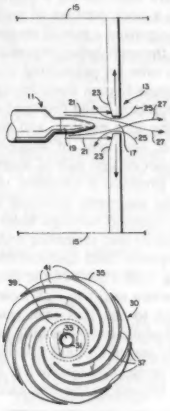
1. An electron emitter assembly for electric field electron emission comprising: a field effect electron emitter composite having a plurality of minute, elongated, parallel, conductive fibers; an insulation filler, each fiber being insulated from and held substantially equidistant from adjacent fibers by said insulation; each fiber having first ends thereof terminated in a plane for emitting electrons therefrom, said first ends extending a uniform distance beyond the surface of said insulation for providing electron field emission; and a conductive backing plate in common with the second end of each of said fibers for conveying an electrical potential thereto; and a conductive material covering selected ones of said fiber first ends for preventing electric field emission from said covered fibers when the remaining uncovered fibers are emitting electrons.

4,345,182

ELECTRODE HAVING SPIRAL-SHAPED ELECTRICALLY CONDUCTING REGIONS THEREIN USEFUL AS AN ANODE IN ELECTRON BEAM DISCHARGE DEVICES

John L. Adamski, Bothell, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 2, 1980, Ser. No. 155,520
Int. Cl.³ H01J *1/46, 17/04, 19/38, 19/40*
U.S. Cl. 313—348 11 Claims



1. An electrode useful as an anode in an electron beam discharge device in which electrons are emitted from a cathode source, comprising:

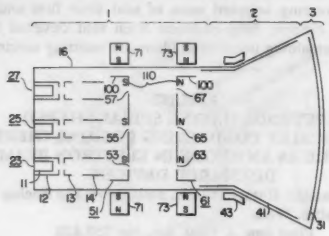
electrode means, including means located in the vicinity of the outer rim of the electrode means for grounding the electrode means to the discharge device, said electrode means having an approximately central opening therein, through which electrons from the cathode source move, for forming an electron beam downstream of said electrode means, said electrode means further having regions of electrical conductance, separated by regions of electrical non-conductance, extending radially outwardly from the central opening and arranged so that the regions of electrical conductance are angularly displaced between their beginning points, which are located relatively towards the central opening and their termination points, which are located relatively away from the central opening in the vicinity of the outer rim of the electrode, so that in operation, an electrical current is established in the regions of electrical conductance by those electrons which strike said electrode means and follow an angularly displaced path to said grounding means, resulting in the creation of a magnetic field about the central opening, which assists in focusing the electrons emitted from the cathode source through the central opening to form the electron beam.

4,345,183

COLOR PICTURE TUBE WITH MAGNETIC FOCUSING SYSTEM

Kyohei Fukuda, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 20, 1978, Ser. No. 917,179
Claims priority, application Japan, Jun. 20, 1977, 52/72058
Int. Cl.³ H01J *29/52*
U.S. Cl. 313—412 **14 Claims**



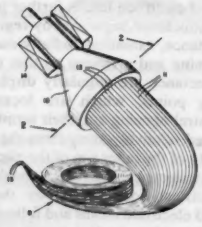
1. A color picture tube having a plurality of electron guns disposed in-line in a neck portion of said tube, said magnetic focusing means comprising a pair of magnetic members of high permeability with through holes disposed in-line in a horizontal direction of the tube for permitting electron beams emitted from the electron guns to pass therethrough, respectively, said pair of magnetic members being disposed separately in the tube axial direction in the neck portion, and magnetizing means for magnetizing one of said pair of magnetic members in one polarity and the other of said pair of magnetic members in the other polarity to produce a plurality of magnetic focusing lenses, each of said magnetic focusing lenses being present between mutually opposed through holes of said pair of magnetic members, each of said magnetic focusing lenses having a non-symmetric magnetic field distribution with respect to the lens axis coinciding with a path of the electron beam proceeding therethrough when said through holes have a shape symmetric with respect to the lens axis, said magnetic focusing means further including compensating means for modifying said non-symmetric magnetic field distribution of each of said magnetic focusing lenses to a symmetric magnetic field which is symmetric with respect to the lens axis.

4,345,184

LIGHT FIBERS HAVING LENGTHS DETERMINED BY BEAM SCANNING TIME

Paul W. Lang, Long Beach, Calif., assignor to Raymus K. Payton, Newport Beach, Calif.

Filed Nov. 10, 1980, Ser. No. 207,181
Int. Cl.³ H01J *29/10, 29/89*
U.S. Cl. 313—475 **1 Claim**



1. An electron beam-responsive light integrator including, in combination:

(a) A plurality of optical fibers having individual light entrance ends and light exit ends, the lengths of said fibers successively decreasing from one to the next adjacent fiber;

(b) individual light emitting sources comprising phosphor material secured to said entrance ends respectively, each of said sources being responsive to impingement of on electron beam thereon to emit light; and

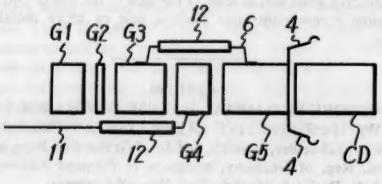
(c) a cathode ray tube including electron beam generating means for providing a beam of electrons, the entrance ends of the fibers being brought in through the screen surface of said cathode ray tube in a circular pattern, said cathode ray tube further including electron beam deflecting means functioning to cause the electron beam to scan in a circular array to thereby successively impinge on said phosphor materials to provide individual pulses of light, the time for light to travel the difference between successive fibers corresponding to the time of scan from one light emitting source to the next adjacent light emitting source, so that individual pulses of light pass from the exit end of said fibers substantially simultaneously.

4,345,185

CATHODE RAY TUBE APPARATUS

Yuzuru Kobori, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 10, 1980, Ser. No. 158,117
Int. Cl.³ H01J *29/96*
U.S. Cl. 315—3 **5 Claims**



1. A cathode ray tube having an electron gun with at least two high voltage electrodes (G3 and G5), a low voltage supply lead, a low voltage electrode (G4) mounted between said high voltage electrodes, a first discharge current suppressing resistor connected between said two high voltage electrodes (G3 and G5) and a second discharge current suppressing resistor connected between said low voltage electrode and said low voltage supply lead.

4,345,186

METAL VAPOR DISCHARGE LAMP

Masato Saito; Michihiro Tsuchihashi; Yoshinori Takai; Keiji Fukuyama, and Keiji Watanabe, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1980, Ser. No. 130,238
Claims priority, application Japan, Mar. 28, 1979, 54-36552; Mar. 30, 1979, 54-37880; Mar. 30, 1979, 54-37881
Int. Cl.³ H01J *7/44, 17/34, 17/78, 29/96*
U.S. Cl. 315—49 **14 Claims**

1. A metal vapor discharge lamp comprising:

an outer bulb;

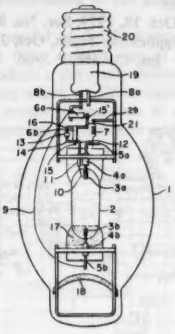
an arc tube disposed in said bulb;

first heat sensitive switch means disposed in said bulb for initiating a discharge in said arc tube, including at least one heat sensitive switch;

second heat sensitive switch means disposed in said bulb in series with said at least one heat sensitive switch, said second heat sensitive switch means having a heat sensitive switching characteristic delayed with respect to that of said first heat sensitive switch means; and

means for producing a discharge within said outer bulb and

outside of said arc tube in the event of fused bonding of said first heat sensitive switch means and subsequent opening of said second heat sensitive switch means, including



discharging parts at different potentials defining a discharge gap by a discharge caused by a surge voltage generated after opening of said second heat sensitive switch means.

4,345,187

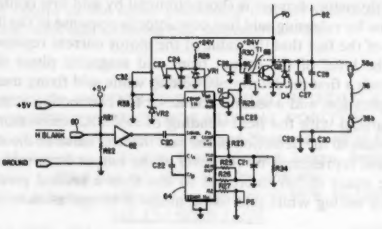
HIGH RESOLUTION, HIGH DENSITY CRT MONITOR

Clarence Casper, Jr., Windsor, Conn., assignor to Moniterm Corporation, Wayzata, Minn.

Continuation of Ser. No. 154,504, May 29, 1980, abandoned. This application May 7, 1981, Ser. No. 261,503

Int. Cl.³ H01J *29/70, 29/76*

U.S. Cl. 315—408 **24 Claims**



1. A cathode ray tube display control circuit for supplying a video control signal to a video control grid of a cathode ray tube, a blanking control signal to a blanking grid of the cathode ray tube, a vertical deflection signal to a vertical yoke, and a horizontal deflection signal to a horizontal yoke, the circuit comprising:

a first input terminal for receiving a vertical sync signal;

a second input terminal for receiving a horizontal blank signal;

a third input terminal for receiving a video signal;

vertical deflection means connected to the first input terminal for providing the vertical deflection signal and a vertical blank signal as a function of the vertical sync signal;

a phase lock loop comprising voltage controlled oscillator means having a VCO input terminal and a VCO output terminal for providing a VCO output signal at the output terminal having a frequency which is a function of a VCO input signal at the VCO input terminal, and phase comparator means having first and second phase comparator input terminals and a phase comparison output terminal, the phase comparator means providing a phase comparator output signal which is a function of a phase comparison between signals at the first and second phase comparator input terminals;

means for providing the horizontal blank signal to the first phase comparator input terminal;

means for providing a VCO input signal at the VCO input terminal which is a function of the phase comparator output signal;

first transformer means having a primary winding and a secondary winding;

first capacitance means connected in series with the primary winding;

second capacitance means connected in series with the horizontal yoke, the second capacitance means and the horizontal yoke being connected in parallel with the first capacitance means;

first semiconductor means having a control electrode and first and second main current carrying electrodes, the first and second main current carrying electrodes being connected in parallel with the first capacitance means, and wherein the horizontal yoke is connected to the first main current carrying electrode for receiving the horizontal deflection signal;

means for providing a drive signal to the control electrode of the first semiconductor means which is a function of the VCO output signal;

means for providing a horizontal retrace signal derived from a circuit including the primary winding and the first and second main current carrying electrodes to the second phase comparator input terminal;

summing means for summing the vertical blank signal with a signal derived from the secondary winding of the first transformer means to produce a summed signal;

means for providing the blanking control signal to the blanking control grid of the cathode ray tube as a function of the summed signal; and

means connected to the third input terminal for providing the video control signal as a function of the video signal supplied to the third input terminal.

4,345,188

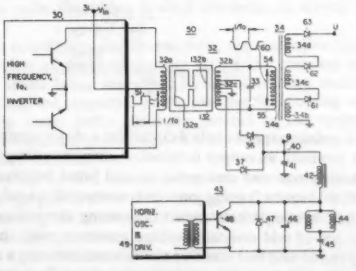
TELEVISION RECEIVER HIGH FREQUENCY REGULATED POWER SUPPLY INCLUDING A LOW VOLTAGE FERRORESONANT TRANSFORMER COUPLED TO A STEP-UP HIGH VOLTAGE TRANSFORMER

Robert J. Gries, Indianapolis, Ind.; Sandor Miko, Torreon, Mexico, and Calvin E. Conn, Carmel, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 2, 1981, Ser. No. 250,129

Int. Cl.³ H01J *29/70*

U.S. Cl. 315—411 **10 Claims**



1. A ferroresonant television display ultor voltage power supply, comprising:

a source of alternating input voltage;

a capacitance;

a saturable reactor forming a ferroresonant arrangement

with said capacitance, said saturable reactor including a magnetizable core and a reactor winding;

means coupled to said source for exciting said saturable reactor into developing an alternating polarity output voltage across said reactor winding, said capacitance generating a circulating current during each half cycle of said alternating polarity output voltage that magnetically saturates at least a portion of said magnetizable core to regulate said alternating polarity output voltage by means of ferroresonant action;

a step-up high voltage transformer including a primary winding and a high voltage secondary winding;

means for coupling said step-up transformer primary winding to the regulated alternating polarity output voltage that is developed by said ferroresonant arrangement without prior rectification of said regulated output voltage for developing a regulated high voltage across said high voltage secondary winding;

an ultor terminal; and

a high voltage rectifier arrangement coupled to said high voltage secondary winding and to said ultor terminal for developing an ultor voltage at said ultor terminal.

4,345,189

MOTOR ROTATION SPEED CONTROL CIRCUIT

Hirokazu Kukaya, and Jun Kishi, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

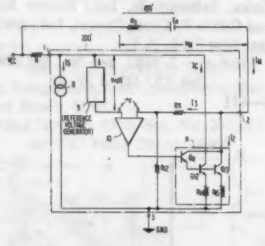
PCT No. PCT/JP79/00050, § 371 Date Oct. 29, 1979, § 102(e) Date Oct. 29, 1979, PCT Pub. No. WO79/00714, PCT Pub. Date Oct. 4, 1979

PCT Filed Feb. 28, 1979, Ser. No. 187,853

Claims priority, application Japan, Feb. 28, 1978, 53-23109

Int. Cl.³ H02P *1/00*

U.S. Cl. 318—317 **12 Claims**



1. A rotation speed control circuit for a motor comprising an input terminal, an output terminal, a constant voltage generator having one end connected to said input terminal, a first resistive element having one end connected to said output terminal, a comparison circuit comparing the voltage at the other end of said constant voltage generator with that at the other end of said first resistive element and deriving a comparison output, and an output circuit supplying first and second output currents to said input and output terminals, respectively, in response to said comparison output of said comparison circuit, said first resistive element generating a voltage drop in response to the variation of a voltage at said output terminal.

4,345,190

CHOPPER CONTROL SYSTEM

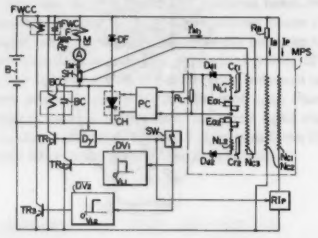
Michimasa Horiuchi, Mito; Masahiko Ibamoto, and Hideaki Rokutan, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 18, 1979, Ser. No. 85,974

Claims priority, application Japan, Oct. 21, 1978, 53-129052

Int. Cl.³ H02P *5/06*

U.S. Cl. 318—338 **6 Claims**



1. A chopper control system including a battery, a DC series motor for driving an electric vehicle, a shunt resistor, a thyristor chopper, said DC series motor, said shunt resistor and said thyristor chopper being connected in series with said battery, a magnetic phase shifter including a first control winding receiving a current instruction signal instructing the motor current of said motor and a second control winding connected across said shunt resistor for carrying out the gate control of said thyristor chopper, and a first contactor acting to short-circuit said thyristor chopper in response to the attainment of the duty factor of said thyristor chopper at a predetermined setting, said chopper control system comprising means for fixing said current instruction signal at a predetermined level while said thyristor chopper is short-circuited by said first contactor, means for releasing said first contactor in response to the detection of the fact that the value of the motor current represented by the level of the output from said magnetic phase shifter exceeds a first predetermined setting while said fixing means is in operation, and a second contactor for connecting a resistor in parallel with the field winding of said DC series motor in response to the detection of the fact that the value of the motor current represented by the level of the output from said magnetic phase shifter decreases to less than a second predetermined setting while said fixing means is in operation.

4,345,191

TWO/ONE (2/1) FAIL OPERATIONAL ELECTROHYDRAULIC SERVOACTUATOR

Imre J. Takats, Bellevue, and Charles C. Chenoweth, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 5, 1980, Ser. No. 175,687

Int. Cl.³ G05B *19/02*

U.S. Cl. 318—564 **35 Claims**

1. A redundant servoactuator system, comprising:

first and second hydraulic servoactuators connected to a positionable load;

a hydraulic control circuit for the servoactuators including a separate hydraulic channel for each channel for the first servoactuator, and a second electrohydraulic servovalve in the channel for the second servoactuator; and

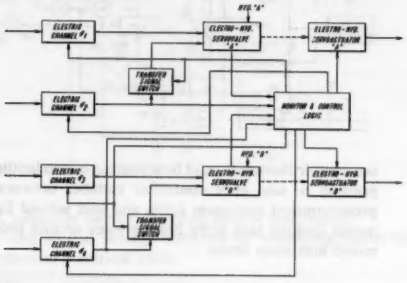
electric control means for said servovalves comprising four signal processing channels, a first one of which is connected to provide an electrical input signal for the first servovalve, and a second one of which is connected to provide an electrical input signal for the second servovalve,

a first valve position sensor connected to the first servovalve

and operable to produce a first rate indicative output corresponding to the position of the first servovalve,

a second valve position sensor connected to the second servovalve and operable to produce a second rate indicative output corresponding to the position of the second servovalve,

a first electronic model of the first servovalve having an electrical input from a third one of said channels and operable to produce a third rate indicative output reflective of the output which would be expected from the first valve position sensor in response to an electrical input equal to the electrical input of the said first model,



a second electronic model of the second servovalve having an electrical input from the fourth channel and operable to produce a fourth rate indicative output reflective of the output which would be expected from the second valve position sensor in response to an electrical input equal to the electrical input of the said second model, and

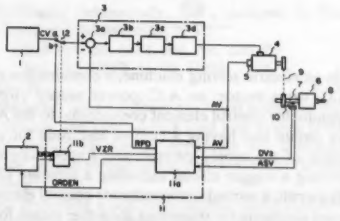
means for comparing said four rate indicative outputs with each other and for providing a failure signal if one of said rate indicative outputs differs from the others of said rate indicative outputs by a predetermined amount indicative of failure of the signal processing channel that is associated with said differing rate indicative output.

4,345,192

CONTROL SYSTEM FOR STOPPING SPINDLE AT PREDETERMINED ROTATIONAL POSITION

Yoshinori Kohzai; Yoshiki Fujioka, and Naoto Ota, all of Hino, Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Sep. 25, 1980, Ser. No. 190,660
Claims priority, application Japan, Oct. 9, 1979, 54-130154
Int. Cl.³ G05B *11/18*
U.S. Cl. 318—592 **9 Claims**



1. A control system for stopping a spindle at a predetermined rotational position, which comprises:

a position control loop for driving the spindle, for reducing to zero a positional deviation between the present rotational position of a specified point on the spindle and the predetermined rotational position, and for stopping the spindle at the specified point on the spindle at the predetermined rotational position, comprising:

a sensor operatively connected to the spindle and to the position control loop, for producing a predetermined voltage signal level, in response to the specified point on the spindle being at the predetermined rotational position, for producing positive or negative voltage signals with respect to said predetermined voltage signal level in response to the specified point on the spindle being to the left or right of the vicinity of the predetermined rotational position, and for producing a fine position deviation voltage varying about said predetermined voltage signal level;

coarse positioning means for generating a coarse position deviation voltage in accordance with the positional deviation between the present rotational position of the specified point on the spindle and the predetermined rotational position; and

position deviation signal generating means for selectively providing one of the coarse position deviation voltage and the fine position deviation voltage as, a position deviation signal, in accordance with the specified point on the spindle being outside the vicinity of the predetermined rotational position or the specified point on the spindle being in the vicinity of the predetermined rotational position, respectively;

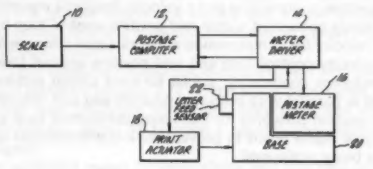
wherein the position control loop drives the spindle in accordance with the coarse position deviation voltage until the specified point on the spindle reaches the vicinity of the predetermined rotational position, and then drives the spindle such that the fine position deviation voltage is reduced to zero after the specified point on the spindle has reached the area in the vicinity of the predetermined rotational position, thereby stopping the specified point at the predetermined rotational position.

4,345,193

DRIVER FOR POSTAGE METERS

Danny R. Barger, Orange; Carl A. Eggert, Northridge, and Paul O. Lloyd, Santa Ana, all of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed Feb. 27, 1980, Ser. No. 125,100
Int. Cl.³ G05B *5/01*
U.S. Cl. 318—612 **3 Claims**



1. A device for driving postage amount handles of a postage meter, the postage amount handles being movable along predetermined paths for setting postage amounts, the device comprising

handle coupling means for receiving the respective handles,

a plurality of shafts supporting the handle coupling means the shafts being supported by linear bearing means for guiding the respective shafts and handle coupling means along linear paths generally parallel to the respective predetermined paths, each of said shafts including a rack formed therein,

a plurality of DC motors coupled to respective shafts through pinion drive means engaging the racks for axially displacing the shafts to thereby move the respective handle coupling means,

motor control means for controllably individually shorting each of the motors for braking the respective shaft and handle coupling means,

encoder means affixed to each respective shaft, each of the encoder means having a plurality of translucent areas therein,

optical sensor means for detecting the light-passing areas to

thereby provide outputs indicative of positions of said shafts,

control means responsive to the optical sensor means output for controlling said motor control means and for braking respective shafts and handle coupling means when the shafts reach predetermined positions, and a dollars button which travels within a guide and index means for depressing the dollars button and for riding within the guide to index the position of the device with respect to the postage meter.

4,345,194

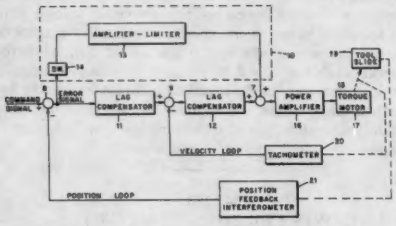
CONTROL SYSTEM TO REDUCE THE EFFECTS OF FRICTION IN DRIVE TRAINS OF CONTINUOUS-PATH-POSITIONING SYSTEMS

Walter L. Green, Concord, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 1, 1980, Ser. No. 212,045

Int. Cl.³ G05D *23/275*

U.S. Cl. 318—621 **4 Claims**



1. In a continuous-path-positioning servo system wherein a position error signal is generated and fed to a drive means by comparing a command position signal with a feedback position signal indicative of the actual position of an object positioned by said drive means in a position control loop including a position lag compensation network series connected within said position control loop and a velocity feedback control loop operatively connected within said position control loop including a velocity lag compensation network series connected with said velocity control loop and said position control loop, the improvement comprising: a feed forward circuit means connected in parallel with both said position and said velocity lag compensation networks for increasing the control loop gain at low error signal levels to prevent stick-slip movement of said object being positioned.

4,345,195

STRAPDOWN MULTIFUNCTION SERVOACTUATOR APPARATUS FOR AIRCRAFT

Carl D. Griffith, and Kenneth L. Oliver, both of Phoenix, Ariz., assignors to Sperry Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 103,243, Dec. 13, 1979. This application Aug. 8, 1980, Ser. No. 176,321

Int. Cl.³ G05B *11/01*

U.S. Cl. 318—628 **18 Claims**

1. A multifunction actuator apparatus for aircraft including a series actuator, the combination comprising:

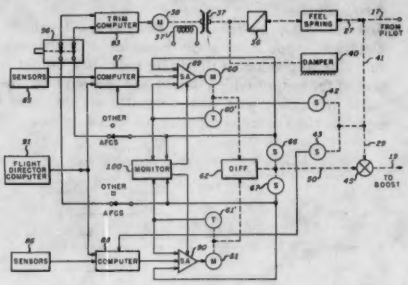
housing means adapted to be mounted directly on the aircraft structure adajcent to the primary pilot controller-to-control surface actuation members and including first and second drive shafts journalled in said housing means,

first linkage means drivably supported on said first drive shaft and coupled with said pilot controller member,

second linkage means including a drive link drivably supported on said second drive shaft and further including a differential link coupled between said control surface member, and drive link and said first linkage means,

series servomotor means including means drivably connecting said servomotor to said second drive shaft for positioning said drive link, and

first and second authority limit means secured to said housing means adjacent said differential link and drive link and



cooperable therewith, said first limiting means limiting the position of said pilot controller member between first predetermined maximum limits and said second limiting means limiting said drive link between second predetermined maximum limits.

4,345,196

SPEED CONTROL DEVICE FOR SEWING MACHINES

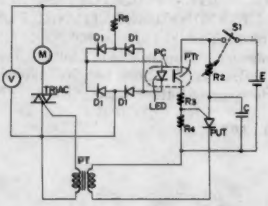
Susumu Hanyu; Yoshinobu Tonomura, and Kazuo Watanabe, all of Hachioji, Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1979, Ser. No. 102,324

Claims priority, application Japan, Dec. 29, 1978, 53-182651[U]

Int. Cl.³ H02P *5/16*

U.S. Cl. 318—812 **4 Claims**



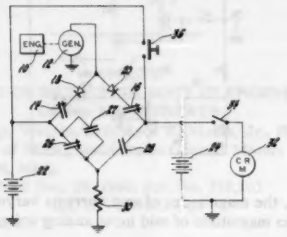
1. In an electric sewing machine, a combination comprising an A.C. drive motor; an A.C. power supply circuit; a first semiconductor control element connectable to the A.C. power supply circuit and having a control electrode for controlling the phase of the supply current; and a speed control device, comprising a trigger circuit including a separate D.C. power supply circuit, a second semiconductor control element having a control electrode for triggering the same; means for connecting the second control element to the D.C. power supply circuit; and an electrically insulating coupling circuit for coupling said speed control device to said A.C. power supply circuit, said coupling circuit including a pulse transformer connecting the trigger circuit to the control electrode of said first semiconductor control element, and a synchronizing electrooptical coupler having a light-emitting part connected to the A.C. power supply circuit and an electric part connected to the control electrode of said second semiconductor element.

4,345,197

VEHICLE BATTERY CHARGING SYSTEM

Ellis G. Wheadon, Anderson, and Robert J. Nowakowski, Indianapolis, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 3, 1980, Ser. No. 126,532
Int. Cl.³ H02J 7/14
U.S. Cl. 320—6 **6 Claims**



1. A vehicular battery charging system comprising:
first and second storage batteries for supplying power to vehicular electrical loads;
a source of charging current;
a bistable switching means for alternatively connecting said storage batteries for charging and discharging, said bistable switchig means having a first state wherein said first storage battery is connected to supply power to said electrical loads and said source of charging current is connected to charge said second storage battery, and a second state wherein said second storage battery is connected to supply power to said electrical loads and said source of charging current is connected to charge said first storage battery; and
means including voltage sensitive elements connected to each of said storage batteries responsive to the voltage of the storage battery that is connected to supply power to said electrical loads for changing the state of said bistable switching means when the voltage of such battery decreases below a reference valve which is independent of the instantaneous terminal voltage of either of said batteries, whereby the voltage supplied to said electrical loads is maintained within a range defined by the nominal terminal voltage of said storage batteries and said reference value.

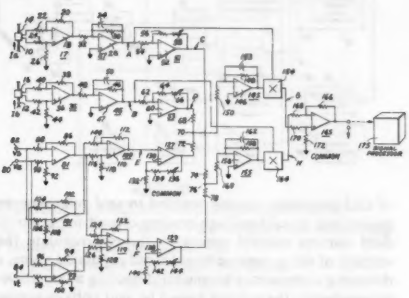
4,345,198

GENERATOR AIR GAP ELECTRICAL TORQUE MONITOR

John F. Wolfinger, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 20, 1981, Ser. No. 236,085
Int. Cl.³ G01R 31/00; H02H 7/06
U.S. Cl. 322—25 **9 Claims**

1. In combination with a 3-phase electrical generator supplying output voltage and current to a load and having armature windings of known resistance, apparatus for continuously monitoring the air gap torque acting on the rotor of the generator, comprising:
first means providing a first load current signal indicative of load current in a first phase of said generator;
second means providing a second load current signal indicative of load current in a second phase of said generator;
first means providing a first armature voltage drop signal indicative of armature voltage drop in said first phase;
second means providing a second armature voltage drop signal indicative of armature voltage drop in said second phase;
first subtractor means providing a first interphase voltage signal representing the difference between the output voltage of said first phase and the output voltage of said second phase;
second subtractor means providing a second interphase voltage signal representing the difference between the output voltage of a third phase of said generator and the output voltage of said first phase;
third subtractor means providing a third interphase voltage difference signal representing the difference between the output voltage of said second phase and the output voltage of said third phase;
fourth subtractor means providing a first difference signal representing the difference between said first interphase voltage signal and said third interphase voltage signal;
fifth subtractor means providing a second difference signal representing the difference between said second interphase voltage signal and said first interphase voltage signal;
first summing means for summing said first difference signal and said second armature voltage drop signal to provide a first summation signal, said first difference signal and said second armature voltage drop signals being of opposite polarity;



second summing means for summing said second difference signal and said first armature voltage drop signal to provide a second summation signal, said second difference signal and said first armature voltage drop signals being of opposite polarity;
first final integrator means for integrating said first summation signal to provide a first final integration signal;
second final integrator means for integrating said second summation signal to provide a second final integration signal;
first multiplier means for multiplying said first final integration signal by said first load current signal to provide a first composite signal;
second multiplier means for multiplying said second final integration signal by said second load current signal to provide a second composite signal;
final subtractor means for subtracting said second composite signal from said first composite signal to produce an air gap torque signal representative of electrically produced torque on the generator rotor; and
means for presenting said air gap torque signal to operating personnel.

4,345,199

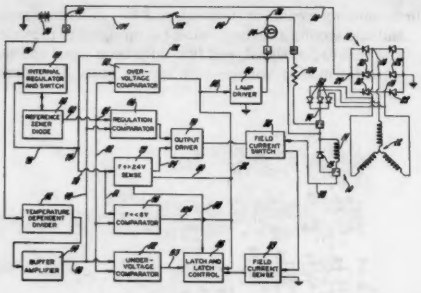
GENERATOR VOLTAGE REGULATOR

Richard J. Voss, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 49,320, Jun. 18, 1979, Pat. No. 4,277,738.
This application Mar. 6, 1981, Ser. No. 241,454
Int. Cl.³ H02J 7/14, 7/24
U.S. Cl. 322—28 **5 Claims**

1. A voltage regulator for a motor vehicle battery charging system that includes an alternating current generator having an

output winding and a field winding, a rectifier means connected to the output winding and a battery connected with the rectifier means to be charged thereby comprising, a voltage sensing circuit adapted to be connected across the battery of a battery charging system for sensing battery voltage, a Zener diode, means connecting said Zener diode with said voltage sensing circuit, reference conductor means connected to one side of said Zener diode providing a substantially constant reference voltage, voltage regulating means connected between said voltage sensing circuit and first and second conductor means, means including said Zener diode for controlling said voltage regulating means so as to maintain a substantially constant regulated voltage across said first and second conductor means the magnitude of which is a function of the break down voltage of said Zener diode, a field current control means adapted to be connected in series with the field winding



of said generator, means coupled to said reference conductor means and to said voltage sensing circuit for controlling said field current control means to thereby regulate the output voltage of the generator to a desired regulated value, and fault detecting comparator means for detecting a condition of operation wherein the voltage sensed by said voltage sensing circuit differs by more than a desired amount from a desired regulated value, said comparator means comprising voltage developing means connected across said first and second conductor means and coupled to said voltage sensing circuit for providing a control voltage that is a function of the regulated voltage applied to said first and second conductor means and the voltage sensed by said voltage sensing circuit, said comparator means including means connected to respond to a predetermined difference in said control voltage and said reference voltage.

4,345,200

LOAD OUTPUT LEVEL CONTROL CIRCUIT

James F. Bedard; Charles W. Eichelberger, both of Schenectady, and Salvatore F. Nati, Jr., Syracuse, all of N.Y., assignors to General Electric Company, New York, N.Y.

Filed Mar. 11, 1981, Ser. No. 242,782

Int. Cl.³ G05B *24/02*

U.S. Cl. 323—350 **15 Claims**

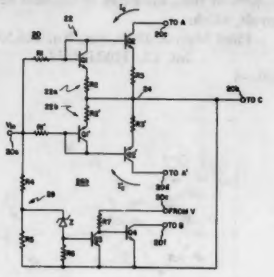
1. A circuit for controlling the output level of a load having an on/off control terminal, a common terminal and a pair of output-level-setting terminals, comprising:

a circuit common line adapted for connection to said load common terminal;

a single input terminal receiving an analog voltage with respect to said common line;

first means for providing to said on/off control terminal a signal having first and second output levels respectively responsive to said input analog voltage being respectively less than and greater than a predetermined magnitude respectively for controlling said load to the on and off conditions; and

means connected between said single input terminal and said load output-level-setting terminals for sinking essentially equal amounts of current from each of said load output-level-setting terminals to establish the output level of said



load, the magnitudes of said currents varying responsive to the magnitude of said input analog voltage.

4,345,201

FAULT LOCATION SYSTEM WITH ENHANCED NOISE IMMUNITY

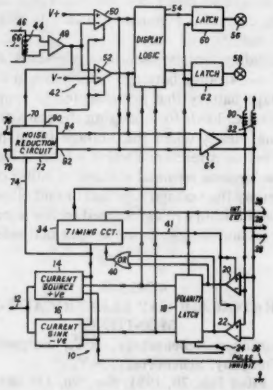
Brett A. Thompson, Poole; John A. Webb, Ferndown, and Martin B. White, Sopley, all of England, assignors to Membrain Limited, Dorset, England

Filed Jun. 20, 1980, Ser. No. 161,484

Claims priority, application United Kingdom, Dec. 20, 1979, 7943989

Int. Cl.³ G01R *31/08, 31/28*

U.S. Cl. 324—52 **9 Claims**



5. Apparatus for locating a fault in a powered electronic circuit, the apparatus comprising:

means arranged repetitively to apply to a conductor of said circuit pulses of current of predetermined sense and each having an approximately triangular waveform with a relatively steep leading edge and a relatively less steep trailing edge;

means arranged to sense magnetic field changes induced adjacent to said conductor by the leading edge of each said pulse and by noise currents in said circuit, so as to produce signals representative of said pulse-and noise-induced changes;

integrating means arranged to receive and integrate first and second pluralities of said change-representative signals to produce respective signals representative of the respective average values of said first and second pluralities of said change-representative signals, one of said first and second

pluralities of signals being produced in response both to said pulses and to said noise, and the other being produced in response only to said noise; and

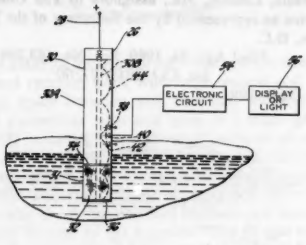
means responsive to the magnitude and polarity of the difference between the two average-representative signals to produce a signal indicative of the direction of flow of said current pulses along said conductor, whereby to permit the determination of the direction of said fault relative to the point on said conductor at which said pulses are applied.

4,345,202

METHOD OF DETECTING SOOT IN ENGINE OIL USING MICROWAVES

Louis L. Nagy, Warren, and Mark E. Myers, Jr., Bloomfield Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 19, 1980, Ser. No. 218,163
Int. Cl.³ G01R 27/04
U.S. Cl. 324—58.5 B **3 Claims**



1. A method of measuring the concentration of soot particles in engine oil substantially independently of the oil composition and non-soot contaminants comprising the steps of

coupling X band energy into a sample of the oil whereby the wavelength of the energy in the oil is modified by the permittivity of the oil, and

sensing the modified wavelength and determining therefrom a value representing the permittivity of the oil wherein the permittivity is a measure of the soot concentration and is substantially independent of non-soot contaminants and oil composition.

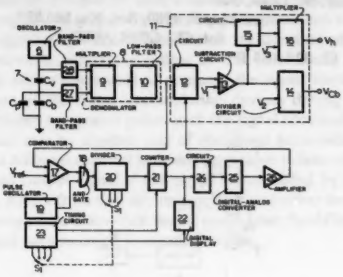
4,345,203

DEVICE FOR MEASURING THE LUBRICATION OF SURFACES ROLLING OR SLIDING RELATIVE TO EACH OTHER AND LUBRICATED WITH A LUBRICANT

Karel N. Vermeiren, Woerden; Rutgerus S. Heemskerk, Vianen, and Hendrik Dolfsma, Nieuwegein, all of Netherlands, assignors to SKF Industrial Trading & Development Company, B.V., Nieuwegein, Netherlands

Filed Jun. 25, 1980, Ser. No. 162,953
Int. Cl.³ G01R 27/26
U.S. Cl. 324—61 R **11 Claims**

1. Device for measuring the lubrication of surfaces rolling or sliding relative to each other and lubricated by a lubricant, provided with an oscillator generating an AC voltage signal by means of which the capacitance occurring between the lubricated surfaces is measured, characterized in that the said capacitance is first grounded and then connected by way of a condenser to the output of the oscillator, which output is connected further to a first input of a demodulating circuit, while the voltage occurring across the capacitance is delivered to a second input of the demodulating circuit, the output of the demodulating circuit being connected to a processing unit that derives a signal corresponding to the thickness of the lubricant film as well as the percentage contact time during a certain



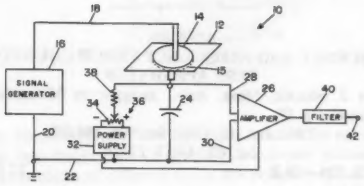
interval of measurement from the output signal of the demodulating circuit.

4,345,204

BRIDGELESS DIELECTRIC MEASUREMENT

Donald L. Shelley, Millersville, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Oct. 20, 1980, Ser. No. 198,974
Int. Cl.³ G01R 27/26
U.S. Cl. 324—61 R **7 Claims**



1. A method for measuring dielectric properties of a material sample at a frequency of less than 10 Hz., comprising:

selecting a series capacitor having a capacitance value at least 100 times the capacitance anticipated for the sample and at least 100 times the stray capacitance in parallel with the series capacitor; having a reactance at the testing frequency of no more than 1/100 of the anticipated leakage resistance of the sample; and having a leakage resistance of its own which is at least 100 times as great as its reactance at the testing frequency;

placing the material sample between test electrodes to form a test configuration;

connecting the series capacitor in series with the test configuration;

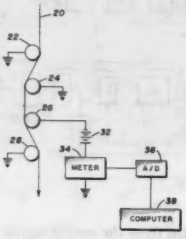
applying a test voltage of the testing frequency to the series circuit of the test configuration and the series capacitor; and

reading the voltage across the series capacitor with a high input impedance measuring means whose input impedance is at least 100 times the reactance of the series capacitor at the testing frequency.

4,345,205
FINISH MONITOR

Joseph P. Sung, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed May 5, 1980, Ser. No. 146,857
Int. Cl.³ G01R *27/02*
U.S. Cl. 324—65 R **1 Claim**

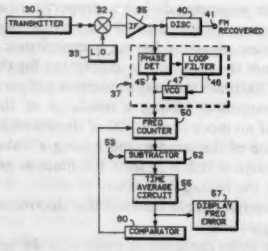


1. Apparatus for determining the level of finish on a running yarn, comprising, in combination:
   a. first and second conductive means for contacting said yarn at respective first and second points spaced along the path of said yarn;
   b. means for connecting said first conductive means to a point of fixed potential;
   c. means for responding to the impedance along the portion of said yarn spanning said first and second conductive means, said last-named means comprising a closed series circuit comprising said first and second conductive means, said portion, a power source, and means for responding to current flow along said yarn between said first and said second conductive means; and
   d. a third conductive means for contacting said yarn at a point downstream of said second conductive means, and means for connecting said third conductive means to said point of fixed potential.

4,345,206
FREQUENCY AND FREQUENCY ERROR COUNTING IN TEST APPARATUS

Robert J. Skalka, Mesa, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Jun. 10, 1980, Ser. No. 158,098
Int. Cl.³ G01R *23/14*
U.S. Cl. 324—79 R **12 Claims**

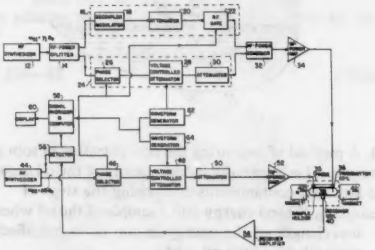


1. Test apparatus designed to be coupled to a transmitter to be tested, for receiving output signals therefrom and providing an indication of carrier frequency error or deviation, said apparatus comprising:
   (a) a local oscillator and mixer for reducing the received carrier frequency by a predetermined frequency;
   (b) filtering means connected to said mixer for receiving output signals therefrom and filtering the signals to obtain the reduced carrier frequency substantiall interference free;
   (c) a frequency counter connected to said filtering means for receiving the filtered reduced carrier frequency and providing a count of cycles per unit of time;
   (d) a subtracting circuit, including means for introducing a predetermined number of cycles per unit of time for a preselected intermediate frequency, coupled to receive the count for the reduced carrier frequency and providing an output signal indicative of the difference between the reduced carrier frequency and the intermediate frequency; and
   (e) indicating means coupled to receive the output signal from said subtracting circuit and provide an indication of the frequency error or deviation between the reduced carrier frequency and the intermediate frequency.

4,345,207
METHOD AND APPARATUS FOR OBTAINING ENHANCED NMR SIGNALS

Richard D. Bertrand, Dearborn Heights, Mich.; Gerard C. Chingas; Allen N. Garroway, both of Oxon Hill, Md., and William B. Moniz, Clinton, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 24, 1980, Ser. No. 143,398
Int. Cl.³ G01N *27/00*
U.S. Cl. 324—308 **17 Claims**



1. A method for NMR spectroscopic analysis of liquids having at least two nuclear spin species which comprises:
   subjecting said liquid to a magnetic field;
   transferring pin polarization from at least one nuclear species to at least one other nuclear species by the steps comprising:
      spin-locking at least one species by rf irradiation; modulating the amplitude and/or phase of said spin locking rf irradiation; and
      applying other rf irradiation that varies in amplitude and/or phase to at least one other nuclear species so that spin polarization is transferred from said spin-locked nuclear species to said other species; and
   detecting directly the NMR signal from said other species.

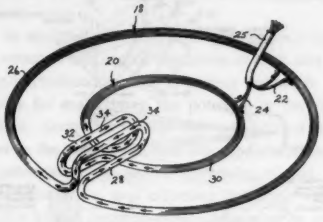
4,345,208
ANTI-FALSING AND ZERO NULLING SEARCH HEAD FOR A METAL DETECTOR

Paul S. Wilson, 4415 Brookton Dr., South Bend, Ind. 46614

Filed May 5, 1980, Ser. No. 146,383
Int. Cl.³ G01V *3/11*
U.S. Cl. 324—329 **5 Claims**

1. In a metal detector including a search head for sensing the presence of a metal object when the head is brought into proximity with said object, said head having mounted therein a transmitter coil adapted to receive a current and receiver coil adapted to sense the magnetic field produced about said transmitter coil by said current, said transmitter coil having first and second coil sections, said receiver coil having first and second

coil sections, the first coil section of each transmitter and receiver coil being displaced from the second coil section of each coil, said first coil section of the transmitter coil lying in substantially the same plane as and spaced apart from the first coil section of the receiver coil with the receiver coil first coil section being located within the magnetic field produced about said transmitter first coil section by said current, whereby the presence of said metal object in proximity of said transmitter coil first coil section will cause a reduction in the magnetic field induced voltage in the receiver coil first coil section, the improvement wherein said second coil sections of the transmitter and receiver coils are juxtaposed and in a spaced relation-



ship from the plane of location of said first coil sections of the transmitter and receiver coils with each second coil section overlying the space between said first coil sections of the receiver and transmitter coils and lying in a plane generally perpendicularly oriented to the plane of location of said first coil sections of the transmitter and receiver coils, said receiver coil second coil section being located within the magnetic field produced about said transmitter coil second section by said current, whereby the voltage in said receiver coil second coil section induced therein by the magnetic field of said transmitter coil second coil section is substantially unaffected by said presence of said metal object.

4,345,209

MISSING PULSE DETECTOR

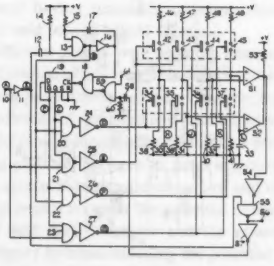
Michael J. Walker, Warley, England, assignor to Lucas Industries Limited, Birmingham, England

Filed May 21, 1980, Ser. No. 152,127

Claims priority, application United Kingdom, May 25, 1979, 7918385

Int. Cl.³ H03K *5/19, 5/26*

U.S. Cl. 328—120 **5 Claims**



1. A missing pulse detector for producing an output signal whenever a pulse is missing from a regular, but variable frequency, pulse train supplied to the detector by accumulating a signal in a signal accumulating device during the interval between successively received pulses and analyzing the signal accumulated, said detector comprising a plurality of signal accumulating devices, reset means for each signal accumulating device, signal admission means for each signal accumulating device such that some of the signal accumulating devices have a higher rate of signal accumulation than the remainder, sequence control means controlled by the input pulse train and connected to control each of said reset means and each of said signal admission devices in such a manner that each signal accumulating device is reset by alternate pulses and then accumulates a signal for a time dependent on the duration of the intervals between successive pulses of the pulse train, and comparison means connected to compare the signal accumulated by one of the signal accumulating devices during one interval between successive pulses with the signal accumulated at a different rate by another one of the signal accumulating devices in a different interval between successive pulses and to produce said output signal if the signal accumulated by said one device differs from that accumulated by said other device in the sense opposite that which would result from the different rate of signal accumulation in equal intervals.

4,345,210

MICROWAVE RESONANT SYSTEM WITH DUAL RESONANT FREQUENCY AND A CYCLOTRON FITTED WITH SUCH A SYSTEM

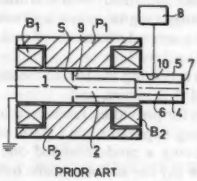
Duc T. Tran, Buc, France, assignor to C.G.R. MeV, Buc, France

Filed May 28, 1980, Ser. No. 153,853

Claims priority, application France, May 31, 1979, 79 13986

Int. Cl.³ H05H *7/00, 13/00*

U.S. Cl. 328—234 **11 Claims**



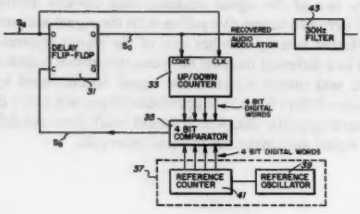
PRIOR ART

1. A resonant system for a cyclotron intended to operate at least at two frequencies f_1, f_2 and to accelerate successively charged particles of different types, this resonant system comprising an enclosure connected to ground and at least one hollow electrode or sector-shaped "Dee" inside which the beam of particles to be accelerated may travel, said electrode being disposed in the enclosure without electrical contact with said enclosure, said enclosure being placed between pole pieces of an electromagnet for supplying a magnetic field required for operation of the cyclotron; the electrode or "Dee" delimiting with the enclosure interaction spaces in which may be accelerated the charged particles issued from a source of particles disposed substantially in the center of the enclosure; means for injecting into the resonant system microwave signals for creating in the interaction spaces an accelerating microwave field; a resonant element provided with an external conductor formed from a cylindrical tube closed at one of its ends and opening at the other end into the enclosure to which it is fixed and, placed in said external conductor, an internal conductor having one end fixed to the "Dee", wherein said internal conductor has the form of a loop said loop determining with the external conductor an adjustable capacity C enables the ratio f_1/f_2 of the operating frequencies f_1, f_2 to be adjusted, the magnetic field required for operation of said cyclotron at frequencies f_1, f_2 being substantially unchanged.

4,345,211
DIGITAL PHASELOCK DEMODULATOR

Joe D. Longworth, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 15, 1980, Ser. No. 187,117
Int. Cl.³ H03K 9/06
U.S. Cl. 329—50 16 Claims



1. A digital phaselock system for demodulating a frequency modulated or phase modulated signal S_{in} comprising:

digital first means, connected for receiving S_{in} and a feedback signal S_f, for providing as output a digital signal indicative of phase between S_{in} and S_f,

second means for providing as output a predetermined number M of different digital words, said words being provided at a rate R_1, and said words being provided in a forward or reverse order as a function of phase between S_{in} and S_f,

third means for providing as output a predetermined number N of different digital words, said words being provided at a rate R_2 which is greater than R_1,

comparison fourth means for receiving the second means words and the third means words and for providing a digital output signal when a predetermined relationship between a second means word and a third means word is incurred,

fifth means receiving the fourth means output and providing S_f to said first means, and

sixth means for providing recovered modulation information to utilizing apparatus, said sixth means being connected for receiving a predetermined one of (a) the first means output or (b) the second means output.

4,345,212
EFFICIENT OPTICAL PULSE STACKER SYSTEM

Lynn G. Seppala, and Roger A. Haas, both of Pleasanton, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 10, 1980, Ser. No. 205,076
Int. Cl.³ H01S 3/098
U.S. Cl. 330—4.3 9 Claims

1. A method for production of a high power laser beam, the method comprising the steps of:

providing a laser amplifier containing an amplifier medium, with an entrance aperture at one end and a concave, substantially perfect reflector mirror at the other end of the amplifier;

providing a collimated initial beam of the frequency to be amplified and of temporal duration τ, whose optical intensity is less than the optical damage threshold for the laser amplifier optical components;

splitting the initial beam into N ($N \geqq 2$) collimated, lower intensity replication beams of the initial beams;

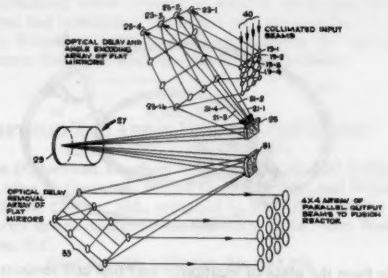
shifting the N replication beams in time and stacking the beams end-to-end so as to form a continuous composite beam of temporal duration substantially $N\tau$, with the N replication beams still being slightly separated spatially from one another;

reflecting the N component replication beams from a first convex reflector so that each replication beam is directed toward and is expanded to substantially fill the optical entrance aperture of the amplifier medium;

exciting the amplifier medium;

passing the composite beam of temporal duration $\Delta t = N\tau$ through the excited amplifier medium to increase the intensity of each replication beam;

reflecting the composite beam from the amplifier medium concave reflector mirror to contract the beam and passing the reflected composite beam through the amplifier medium a second time, in a direction substantially opposite to the direction of the first beam passage therethrough;


COLLIMATED INPUT BEAMS
OPTICAL DELAY AND ANGLE ENCODING ARRAY OF FLAT MIRRORS
OPTICAL DELAY REMOVAL ARRAY OF FLAT MIRRORS
4X4 ARRAY OF PARALLEL OUTPUT BEAMS TO FUSION REACTOR

directing the composite beam toward a second convex reflector that physically separates the composite beam into a sequence of N single replication beams again, each of time duration substantially τ;

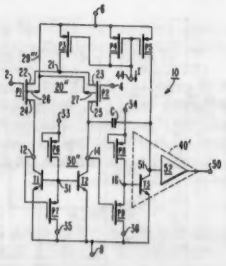
reflecting the composite beam from the second convex reflector such that each replication beam is collimated; and

redirecting and temporally shifting the replication beams so that all replication beams are substantially parallel and are substantially temporally coincident as a spatially contiguous array of replication beams.

4,345,213
DIFFERENTIAL-INPUT AMPLIFIER CIRCUITRY WITH INCREASED COMMON-MODE VOLTAGE RANGE

Otto H. Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 28, 1980, Ser. No. 125,645
Int. Cl.³ H03F 3/45; G06G 7/24
U.S. Cl. 330—253 33 Claims



1. An amplifying circuit operable with input signals having a common-mode component anywhere within a range approaching and including at least one of the operating potentials applied to said amplifying circuit, in combination:

first and second supply terminals for receiving operating potential therebetween;

first and second field-effect transistors of a first conductivity type, each having gate, drain, source and substrate electrodes;

means for connecting said first and second transistors in long-tailed-pair connection including first and second input terminals to which the respective gate electrodes of said first and second transistors connect for receiving input signals, a tail connection to which the respective source electrodes of said first and second transistors connect for receiving a tail current, first and second output connections to which the respective drain electrodes of said first and second transistors connect;

tail current supply means connected between said first supply terminal and said tail connection for supplying said tail current;

means for applying offsetting potentials between the respective substrate and source electrodes of both said first and second transistors, which offsetting potentials are of a polarity for maintaining the potential at the respective substrate electrodes of said first and second transistors closer to the potential at said first supply terminal than is the potential at the source electrodes of said first and second transistors, said offsetting potentials varying responsive to said common-mode component for tending to operate said first and second transistors towards depletion mode when the value of said common-mode component approaches the potential at said first supply terminal more closely than a predetermined voltage and tending to operate said first and second transistors towards enhancement mode when the value of said common-mode component departs from the potential at said first supply terminal by more than said predetermined voltage, said offsetting potentials conditioning said long-tailed pair connection for providing signals at its output connections responsive to said input signals when the common-mode component of said input signals is at a potential between the potentials at said first and second supply terminals and including at least the potential at one of said first and second supply terminals; and

differential to single-ended signal converting means including:

third and fourth transistors of a second conductivity type, having respective output electrodes connected respectively to the first and second output connections of said long-tailed-pair connection, having respective input electrodes, and having respective common electrodes connected to said second supply terminal,

potential-follower means with an input connection at the output electrode of said third transistor and with an output connection at an interconnection between the respective input electrodes of said third and fourth transistors, which potential-follower means is for exhibiting a predetermined offsetting potential between its input and output connections to operate the output electrode of said third transistor at a potential between the potential at the input electrode of said third transistor and the potential at said second supply terminal including the potential at the input electrode of said third transistor, and,

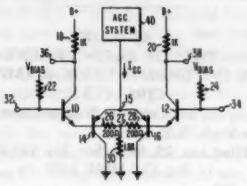
output means for operating the output electrode of said fourth transistor at a potential between the potential at the input electrode of said fourth transistor and the potential at said second supply terminal including the potential at the input electrode of said fourth transistor, and for supplying output signals related to the difference between the signals at the first and second output connections of said long-tailed-pair connection.

4,345,214

VARIABLE EMITTER DEGENERATION GAIN-CONTROLLED AMPLIFIER

Jack R. Harford, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 23, 1980, Ser. No. 143,035
Int. Cl.³ H03F *3/45*
U.S. Cl. 330—254 **10 Claims**



1. A gain-controlled amplifier comprising:

an amplifying transistor having a base electrode coupled to receive input signals, a collector electrode at which output signals are derived, and an emitter electrode;

means, coupled to said base, emitter, and collector electrodes, for biasing said transistor;

a source of gain control current; and

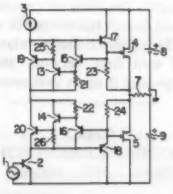
means for controlling the gain of said transistor, having a first electrode coupled to said emitter electrode of said transistor, a second electrode coupled to said source for receiving said gain control current, and a third electrode coupled to a point of reference potential, said gain control current causing a flow of current through said third electrode which is substantially equal to the flow of gain control current at said second electrode, and a flow of current through said first electrode which is substantially less than said flow of gain control current at said second electrode, said first electrode of said means providing a gain-controlling impedance at said emitter electrode of said transistor which is variable as a function of the magnitude of said gain control current.

4,345,215

AUDIO FREQUENCY POWER AMPLIFIER CIRCUIT

Nobutaka Amada, and Shigeki Inoue, both of Toyokawa, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 27, 1980, Ser. No. 181,763
Claims priority, application Japan, Aug. 31, 1979, 54-110399
Int. Cl.³ H03F *3/30*
U.S. Cl. 330—268 **3 Claims**



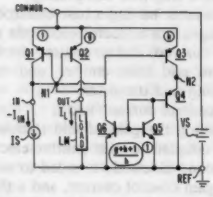
1. An audio frequency power amplifier circuit comprising a pair of output transistors of complementary push-pull type, each having an input electrode and an output electrode, a pair of drive transistors connected in emitter-follower fashion to the input electrodes of said pair of output transistors respectively, two series-connected resistors inserted between the emitters of said pair of drive transistors, a pair of voltage detection transistors of different conduction types each having a base, a collector and an emitter, means for applying the voltage between the emitters of said pair of drive transistors across the base-emitter connection of each of said pair of volt-

age detection transistors, a pair of emitter resistors connected respectively to the emitters of said voltage detection transistors for generating a voltage corresponding to the emitter current of said voltage detection transistors respectively, a pair of constant-voltage sources inserted between the bases of said drive transistors, means for adding the voltages of said emitter resistors to the voltages of said constant-voltage sources respectively, and means for supplying an input signal to the base of each of said drive transistors.

4,345,216
COMPENSATION OF BASE-CURRENT-RELATED ERROR IN CURRENT MIRROR AMPLIFIER CIRCUITRY

Otto H. Schade, Jr., No. Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 25, 1980, Ser. No. 162,939
Int. Cl.³ H03F 3/04
U.S. Cl. 330—288 **6 Claims**



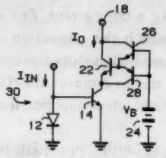
1. A current mirror amplifier comprising:
an input terminal for connecting to a source of output current;
an output terminal for supplying load current to a load;
a common terminal for providing return connection for said input and load currents;
first, second, third and fourth transistors with matched current gain characteristics having respective collector electrodes, said fourth transistor having respective base and emitter electrodes, and the other of these transistors having amongst them at least one base electrode connected to said input terminal and at least one emitter electrode connected to said common terminal, the collector electrodes of said first and second transistors being respectively connected to said input terminal and to said output terminal, the collector electrode of said third transistor being connected to the emitter electrode of said fourth transistor;
means for applying an operating potential to the collector electrode of said fourth transistor; and
means responding to the flow of current through the base electrode of said fourth transistor for supplying a substantial share of the proportionally related base current requirements of said first, second, and third transistors, rather than imposing it upon said source of input current.

4,345,217
CASCODE CURRENT SOURCE

W. David Pace, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 5, 1980, Ser. No. 175,548
Int. Cl.³ H03F 3/04
U.S. Cl. 330—288 **3 Claims**

1. Cascode current source, comprising:
input circuit means receiving an input current supplied at an input for providing an output current at an output which is substantially equal in value to said input current; and
cascode circuit means coupled between said output of said input circuit means and an output of the cascode current source for buffering said input circuit means from variations in the voltage appearing at the output of the cascode circuit means including a pair of transistors connected in a Darlington configuration and a third transistor of complementary conductivity type as said pair of transistors with the base thereof connected with the base of the first transistor of said pair of transistors to a node at which is supplied a reference potential, the emitter being connected

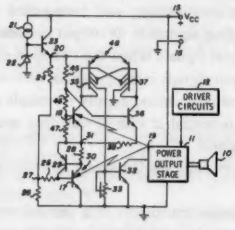


to the interconnected emitter of said first transistor and base of the second transistor and said collector being coupled with the emitter of said second transistor to said output of said input circuit means, the collectors of said first and second transistors being coupled to said output of the cascode current means.

4,345,218
TWO STAGE THERMAL SHUTDOWN

James S. Congdon, Santa Clara, and Tim D. Isbell, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sep. 8, 1980, Ser. No. 185,055
Int. Cl.³ H03F 3/04; H02H 5/04
U.S. Cl. 330—298 **6 Claims**

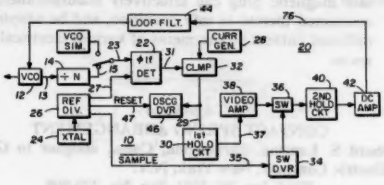


1. A circuit for protecting a semiconductor device from temperature increasing overloads, said circuit acting to shut said device off when its temperature exceeds a maximum value and then acting to turn said device on when the temperature has declined to a lower value, said circuit comprising:
means for thermally coupling at least portions of said circuit to said device;
voltage source means having a controlled and repeatable temperature coefficient of voltage;
disabling means coupled to said device and responsive to a control signal;
first latch means responsive to said voltage source means, coupled to said disabling means to supply said control signal, and operative to turn said device off when said device temperature exceeds a predetermined first maximum value; and
second latch means responsive to said first latch means and to said voltage source, said second latch means being coupled to said disabling means to turn said device off when said device temperature exceeds a predetermined second maximum temperature that is substantially lower than said first maximum temperature, whereby said circuit will permit an excursion to said first maximum temperature and will thereafter limit excursions to said second maximum temperature.

4,345,219
FREQUENCY AGILE HOLD-SAMPLE-HOLD PHASE DETECTOR

Charles R. Jackson, St. Petersburg, Fla., assignor to E-Systems, Inc., Dallas, Tex.

Filed Feb. 14, 1980, Ser. No. 121,346
Int. Cl.³ H03L 7/08
U.S. Cl. 331—1 A 19 Claims



1. A method for developing an output voltage level error signal related to frequency and phase differences between a reference periodic signal and a variable periodic signal for changing the value of said variable periodic signal to that of said reference periodic signal, comprising the steps of:

(a) generating a control signal functionally related to frequency differences detected between the reference and variable periodic signals;

(b) generating a constant current signal;

(c) introducing said constant current signal into a first hold circuit to develop a voltage level therein;

(d) clamping said voltage level developed in said first hold circuit at a level functionally related to said detected frequency differences in response to said control signal;

(e) removing said constant current signal from said first hold circuit in response to said control signal;

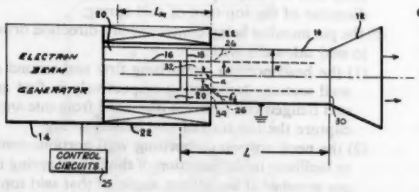
(f) periodically sampling said clamped voltage level signal for developing an error signal functionally related to phase differences detected between the reference and variable periodic signals and storing said error signal in a second hold circuit; and

(g) developing from said stored error signal the output voltage level error signal proportional to frequency and phase differences between the reference and variable periodic signals.

4,345,220
HIGH POWER MICROWAVE GENERATOR USING RELATIVISTIC ELECTRON BEAM IN WAVEGUIDE DRIFT TUBE

Donald J. Sullivan, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 12, 1980, Ser. No. 120,809
Int. Cl.³ H03B 9/01
U.S. Cl. 331—79 1 Claim



1. A high power microwave generator comprising

a waveguide/drift tube, the interior of said waveguide/drift tube is maintained at a vacuum, and

an anode positioned within said waveguide/drift tube,

a relativistic electron beam generator injecting a relativistic electron beam along the longitudinal axis thereof, said electron beam comprising an injected electron beam current, said anode in alignment with said electron beam generator, said anode comprises a grounded aluminum foil member traversing said waveguide/drift tube in intercepting relationship with said relativistic electron beam, said anode functioning in conjunction with said electron beam generator to form a virtual cathode, said waveguide/drift tube having geometric dimensions and said relativistic electron beam having current parameters that in combination effect the virtual cathode oscillation condition within said waveguide/drift tube to generate microwaves at a predetermined frequency, when said electron beam current exceeds the space-charge limiting current of said waveguide/drift tube, microwaves are generated,

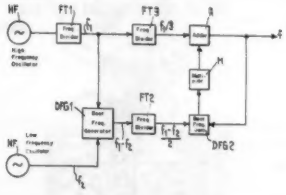
a tuning means for tuning the frequency of said microwaves, said tuning means comprises means for changing the physical dimensions of said waveguide/drift tube, and for varying the parameters of said relativistic electron beam, and,

a magnetic field means generating a cusp magnetic field around said waveguide/drift tube for focusing said electron beam current at said virtual cathode.

4,345,221
TEMPERATURE COMPENSATED SIGNAL GENERATOR INCLUDING TWO CRYSTAL OSCILLATORS

Alphonse Zumsteg, Solothurm, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Filed May 15, 1980, Ser. No. 150,107
Claims priority, application Switzerland, May 22, 1979, 4783-79
Int. Cl.³ H03B 5/04, 5/32
U.S. Cl. 331—176 7 Claims



1. A generator for producing a temperature compensated output signal, comprising:

a high frequency crystal oscillator having a first parabolic temperature dependency;

a low frequency crystal oscillator having a second parabolic temperature dependency different from said first dependency and characterized by a descending portion coinciding with an apex of said first dependency;

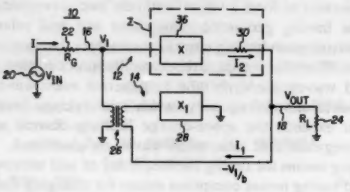
means connected to said high and low frequency oscillators for producing a first intermediate signal and a second intermediate signal substantially equal in frequency to said first intermediate signal; and

means receiving said first and second intermediate signals for producing the output signal such that the output signal is independent of temperature variations.

4,345,222
SPLIT PHASE DELAY EQUALIZER WITH STRAY REACTANCE COMPENSATION

Vernon R. Cunningham, Melissa, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 8, 1980, Ser. No. 214,368
Int. Cl.[3] H03H 7/03
U.S. Cl. 333—28 R 12 Claims

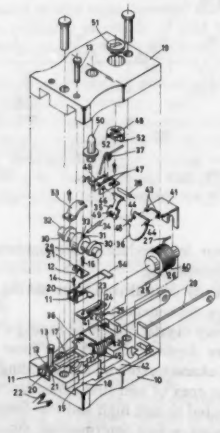


1. A split phase delay equalizer with stray reactance compensation, comprising:
- a pair of circuit branches connected in parallel between an input and an output;
- phase inversion means providing phase reversal between signals in said branches;
- reactance means in one of said branches for providing a phase shift of the signal in that branch at a given frequency to afford an increased delay at such frequency; and
- auxiliary compensating reactance means in the other of said circuit branches for compensating third order amplitude response of said equalizer around said given frequency wherein said auxiliary compensating reactance means provides a third order rise and dip opposing third order rise and dip in the amplitude response curve caused by stray reactance.

4,345,223
FUSELESS SAFETY MAGNETIC PLUG

Yu Chien-Chun, 730 Yen-ping Rd., Hsin-chu City, Taiwan

Filed Oct. 28, 1980, Ser. No. 201,529
Int. Cl.[3] H01H 77/00
U.S. Cl. 335—6 5 Claims

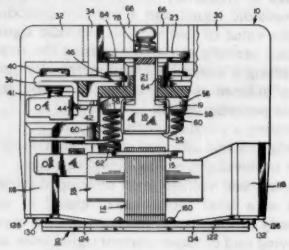


1. A fuseless safety magnetic plug comprising:
- a housing structure having a base with at least two electrical channels therein, a cover, and two prongs;
- a pair of wire coupling devices mounted on the base;
- a magnetic device connected respectively to each of said electrical channels on the base for protecting the plug from overloading by automatically breaking the circuit to open;
- a current adjusting device matching with the magnetic device for setting different current load therein;
- a cam mechanism matching with said magnetic device for circuit breaking; and
- a load discharging bolt matching with said cam mechanism for circuit re-connection after circuit breaking whereby said magnetic plug can effectively maintain the circuit connected thereto in safe condition, and be adaptable to different current requirements of various electrical appliances.

4,345,224
CONTACT SPRING ARRANGEMENT

Richard S. Lenzing, Farmington, Conn., assignor to General Electric Company, New York, N.Y.

Filed Jan. 30, 1981, Ser. No. 229,908
Int. Cl.[3] H01H 50/02
U.S. Cl. 335—132 9 Claims

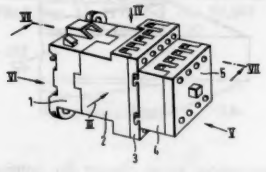


1. In an electromagnetic contactor having an armature resiliently biased in spaced relation to an energizable magnet, a moveable contact carrier adapted to move responsive to attraction of the armature by the magnet, a pin member comprising a head portion and a neck portion extending from the moveable contact carrier, a moveable contact bridge extending about the pin member, a helical spring engaged between the head portion of the pin member and the contact bridge to resiliently support the contact bridge on the carrier so that movement of the contact carrier engages the contact bridge with stationary contact means, the combination comprising:
- (a) the contact carrier comprising a surface adapted to support at least one contact bridge;
- (b) the pin member extending from the surface of the contact member;
- (c) the contact bridge comprising interior walls defining an aperture and adapted to extend about the pin member;
- (d) the helical spring comprising a top turn and additional turns having an inside diameter greater than the inside diameter of the top turn;
- (e) the pin member comprising opposing sidewalls displaced from one another by a distance smaller than the inside diameter of the top turn of said spring;
- (f) the pin member being contoured in a direction orthogonal to said sidewalls with;
  - (1) the head portion comprising first and second sloping wall sections terminating respectively in first and second flanged end portions displaced from one another to capture the top turn of said helical spring;
  - (2) the neck portion comprising wall portions configured to facilitate initial insertion of the helical spring into the pin member at an oblique angle so that said top turn is captured sequentially by said second and said first flange portions whereby spring insertion is achieved with minimal radial displacement of the turns of the spring.

4,345,225
SWITCH

Helmut Lemmer, Marienheide, Fed. Rep. of Germany, assignor to Starkstrom Gummersbach GmbH, Marienheide, Fed. Rep. of Germany

Filed Mar. 12, 1981, Ser. No. 242,854
Claims priority, application European Pat. Off., Mar. 13, 1980, 80/101315
Int. Cl.³ H01H *67/02*
U.S. Cl. 335—132 **11 Claims**



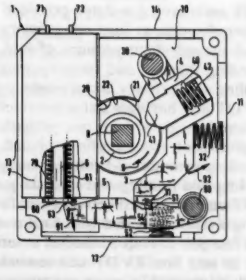
1. In a switch used as a power or auxiliary switch or the like of the type including a housing having a mounting side, a contact system mounted in said housing, a magnetic system which actuates the contact system mounted in the housing and a cover which closes the housing at an end thereof facing away from its mounting side, wherein said contact system further comprises contact bars coupled to contact connecting screws and stationary contact members, as well as commonly actuable bridges with movable contact members which cooperate with said stationary contact members to act as opening and/or closing devices, wherein the contacts of said contact system are disposed in at least two different planes at different distances from the mounting plane defined by said mounting side, and wherein each bridge together with the associated movable contact members and the associate contact bars, with the stationary contact elements are each mounted in a limited switch chamber, the improvement comprising:

said switch chambers at each plane being laterally offset with respect to each other while having commonly aligned plane side faces which define a predetermined constant width from plane to plane, so that each contact connecting screw is freely accessible in the different distance planes of the wiring to be secured by said contact connecting screws.

4,345,226
ROTARY SWITCH WITH AN AUTOMATIC RE-SETTING MECHANISM

Jean Debaigt, Maisons Laffitte, France, assignor to CGEE Alsthom, Levallois-Perret, France

Filed Apr. 27, 1981, Ser. No. 258,162
Claims priority, application France, Apr. 25, 1980, 80 09313
Int. Cl.³ H01H *9/20*
U.S. Cl. 335—166 **5 Claims**



1. A rotary switch for switching electrical power, said switch including a resiliently biased holding electromagnet capable of being powered by the same power supply as that which is switched by the switch, a switch-operating control shaft provided with a return spring resiliently urging said shaft in rotation towards an "OFF" position, and an automatic re-setting mechanism responsive to loss of power to the electromagnet to cause the switch to return to said "OFF" position, wherein the re-setting mechanism comprises:

a positioning cam fixed with said control shaft and including at least one positioning notch;

a first lever rotatable about a first fixed point and having a locking catch spaced from said first fixed point, said first lever further having a resiliently biased cam follower directed towards said control shaft for engaging said notch in said positioning cam in such a manner as to retain the shaft in an "ON" position against the resilient bias of said return spring; and

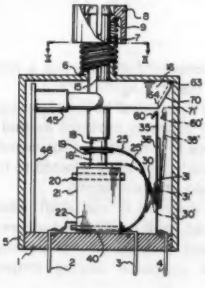
a second lever rotatable about a second fixed point and having a nose spaced from said second fixed point resiliently biased against a moving head of the electromagnet, said second lever further having a bearing surface for receiving the locking catch of said first lever to hold said first lever against the resilient thrust of its cam follower;

the relative positions of the electromagnet, the first and second levers, and the shaft being such that so long as power is supplied to said electromagnet, the power holds the electromagnet against its own resilient bias, said second lever holds said first lever against the resilient bias of the cam follower, and said cam follower engages in said positioning notch to hold said shaft against the bias of the return spring, but that, on failure of power to the electromagnet, the nose of the second lever is thrust by the resilient bias of the electromagnet in such a direction as to cause the bearing surface to disengage from the catch, thereby releasing the first lever to allow it to rotate away from the shaft under the thrust of the cam follower, and hence disengaging the cam follower from the positioning notch and thus allowing the return spring to return the shaft to the "OFF" position.

4,345,227
PUSH-ON PUSH-OFF SWITCH

Rodney Hayden, Stoney Creek, Canada, assignor to TRW Inc., Cleveland, Ohio

Filed May 21, 1981, Ser. No. 265,946
Claims priority, application Canada, Jun. 10, 1980, 353697
Int. Cl.³ H01H *45/02, 51/06*
U.S. Cl. 335—186 **8 Claims**



1. An electrical switch which comprises a winding,

a magnetic core movable into said winding between an open and closed position,

a first contact carried by said core,

means mounting said first contact to said core for moving said contact towards and into electrical connection with a second contact upon movement of said core between said

open and closed position, said core being urged to said open position in the absence of magnetizing field exerted by said winding,

means connecting one end of said winding to said first contact,

plunger means for urging said core into said winding upon manual movement of said plunger means in a chosen direction,

a spring mounting for said second contact permitting resilient movement of said second contact upon connection with and pressing by said first contact when said core is moved into said closed condition,

an arm carried by said plunger movable into contact with said second contact mounting means for urging said mounting means in a direction to move said second contact away from said first contact only when said core is in said closed condition and said plunger is manually actuated and moved in the chosen direction to urge said core into said winding.

4,345,228

ROTARY ACTUATOR

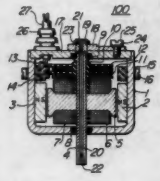
Takaharu Idogaki, Okazaki; Hisasi Kawai; Takeshi Matsui, both of Toyohashi; Kyo Hattori, Susono, and Kazuhiro Sakurai, Gotenba, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Apr. 23, 1981, Ser. No. 256,832

Claims priority, application Japan, Apr. 24, 1980, 55/54979

Int. Cl.³ H01F *7/14*

U.S. Cl. 335—222 **7 Claims**



1. A rotary actuator for imparting a rotational force to a driven element, comprising:

a substantially cylindrical hollow housing,

a hollow shaft rotatably mounted on said housing,

a driving means for imparting a rotational driving torque to said shaft, said shaft being adapted to be operatively connected to said driven element,

a torsion bar disposed in said shaft substantially coaxially therewith and having a first end secured to said shaft and a second end secured to said housing to thereby act against said rotational driving torque of said driving means,

first means for securing said first end of said torsion bar to said shaft, and

second means for securing said second end of said torsion bar to said housing, each of said first and second means including a tapered member formed with an axial central hole for securely receiving said torsion bar therein and a slit radially extending between said central hole and the tapered outer peripheral surface of said tapered member.

4,345,229

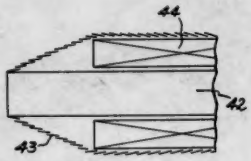
AMORPHOUS METAL BALLASTS AND REACTORS

Robert P. Alley, Manlius, and Russell E. Tompkins, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 966,855, Dec. 6, 1978, Pat. No. 4,288,773. This application Mar. 2, 1981, Ser. No. 239,753

Int. Cl.³ H01F *27/24*

U.S. Cl. 336—83 **3 Claims**



1. An amorphous metal reactor for lighting and general applications comprising an elongated generally cylindrical core made of magnetic material, a coil mounted on and magnetically coupled with said core, and a helical wrapping of overlapped amorphous metal ribbon enclosing said coil and contacting said core at both ends.

4,345,230

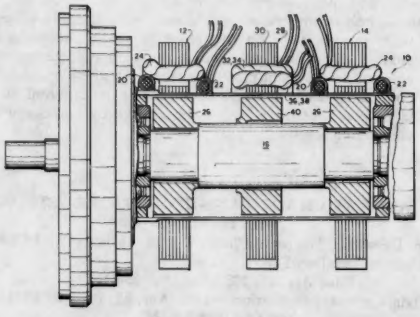
MULTIPLE ROTARY VARIABLE DIFFERENTIAL TRANSFORMER ON COMMON SHAFT WITH LEAKAGE FLUX COMPENSATION

Jacob Chass, Rego Park, N.Y., assignor to Pickering & Company, Inc., Plainview, N.Y.

Filed Feb. 2, 1981, Ser. No. 230,337

Int. Cl.³ H01F *21/06*

U.S. Cl. 336—135 **6 Claims**



1. A rotary variable differential transformer (RVDT) comprising:

a first RVDT unit having a stator provided with a rotor opening therethrough, at least one primary and one secondary coil wound about portions of said stator, and a rotor extending through said rotor opening for magnetically coupling said primary and secondary coils;

a second RVDT unit having a stator provided with a rotor opening therethrough, at least one primary and one secondary coil wound about portions of said stator, and a rotor extending through said rotor opening for magnetically coupling said primary and secondary coils;

a third RVDT unit interposed between said first and second units having a stator provided with a rotor opening therethrough, a first pair of coils connected in series opposition connected to said first RVDT unit secondary, a second pair of coils connected in series opposition connected to said second RVDT unit secondary, said first and second

pairs of coils mounted to said third RVDT unit stator, and a rotor extending through said rotor opening for magnetically coupling said first and second pairs of coils; and,

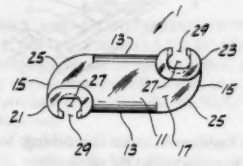
a shaft extending between said first and second RVDT units and having said first, second and third RVDT unit rotors affixed thereto.

4,345,231

SUPPORT MEMBER

Joseph S. Cline, and Cletus N. Andres, both of Highland, Ill., assignors to Basler Electric Company, Highland, Ill.

Filed Nov. 13, 1979, Ser. No. 93,697
Int. Cl.³ H01F *15/10*
U.S. Cl. 336—192 **10 Claims**



1. In combination with an electrical device having a wire end and an electrical connector on the wire end, the connector having a shank secured to the wire end and a terminal portion extending beyond the wire end, a portion of said shank as secured to the wire end having, in transverse section, maximum first and second dimensions generally at right angles to one another, the second being smaller than the first, a member of relatively rigid insulating material supporting the wire end and shank secured thereto in fixed position relative to the electrical device, said member having a recess therein extending therethrough, said recess being open at one end and receiving the wire end and being open at the other end to enable the terminal portion of the connector to extend out of the recess, said member having a slot therein extending axially of the recess from one end to the other, a portion of said slot having a width slightly greater than said second dimension but less than said first dimension, whereby said portion of the shank is entered laterally through said portion of the slot into the recess and said connector and said member turned relative one to the other generally on the axis of the shank to a position in which said first dimension extends generally widthwise of the slot thereby to prevent the shank from moving laterally out through the slot, a portion of the recess being of such cross section as to receive said portion of the shank with a relatively snug fit when the connector is turned to said position, and said member being mounted in fixed position relative to said electrical device, thereby holding the connector and the wire end against bending of the wire adjacent the shank to avoid breakage of the wire thereat.

4,345,232

NON-METALLIC CORE BAND

Angelo A. DeLaurentis, South Pymatuning, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 22,126, Mar. 20, 1979, abandoned. This application Dec. 12, 1980, Ser. No. 216,213
Int. Cl.³ H01F *27/26*
U.S. Cl. 336—210 **1 Claim**

1. Electrical induction apparatus, comprising:

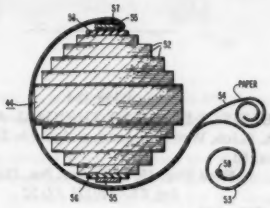
a magnetic core, said magnetic core including a plurality of superposed metallic magnetic laminations arranged to provide a magnetic circuit having leg and yoke portions;

a frame about said magnetic core including a metallic lock plate member disposed adjacent to the outer surface of an outermost lamination of at least one leg portion, which lock plate member extends between the yoke portions;

non-metallic banding means, said non-metallic banding means including a plurality of spaced bands of non-metallic material each having first and second ends, a predetermined width, and a length sufficient to completely encircle said at least one leg portion and overlap at least some portion of itself;

said lock plate member functioning as a common anchor for said plurality of spaced bands, with the first ends of said non-metallic bands being disposed between said lock plate member and said leg portion;

each of said non-metallic bands being folded back over said lock plate member to completely encircle said leg portion, with its second end overlapping the portion of itself disposed adjacent to said lock plate member;



means fastening the overlapped portions of each of said non-metallic bands together;

each of said non-metallic bands having a predetermined tension therein which causes said lock plate member and said laminations to be compressed tightly together, with said lock plate member, which retains its assembled positional relationship as a permanent and functional part of said magnetic core, firmly anchoring the first ends of said non-metallic bands;

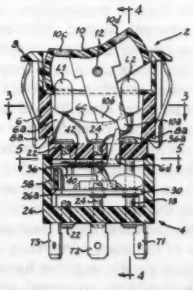
and winding means disposed over said at least one leg portion, with the overlapped, fastened portions of said non-metallic bands being between the winding means and said at least one leg portion.

4,345,233

MANUAL SWITCH WITH TIMED ELECTRO-THERMAL LATCH RELEASE

Alan A. Matthies, Milwaukee, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 2, 1981, Ser. No. 239,872
Int. Cl.³ H01H *37/74*
U.S. Cl. 337—75 **6 Claims**



1. A manually operable electric switch having a timed, electro-thermal latch release comprising, in combination:

an insulating housing;

switch contacts mounted in said housing;

operator means mounted in said housing and manually oper-

able to actuate said contacts between open and closed circuit positions;

means biasing said contacts to a normally open circuit position;

electro-thermal latch means mounted in said housing and operable in a de-energized condition to restrain said operator means in a position effecting a closed circuit position of said contacts; and

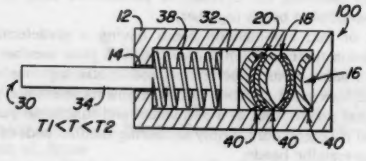
electric timing means mounted in said housing energizable upon closure of said switch contacts to initiate a timing period and operable upon completion of said timing period to energize said electro-thermal latch means to release said operator means and causing said switch contacts to be opened.

4,345,234

MULTIPLE ELEMENT THERMAL ACTUATOR

Steven A. Reich, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Dec. 15, 1980, Ser. No. 216,393
Int. Cl.³ H01H *37/52*
U.S. Cl. 337—336 **4 Claims**



1. A thermal actuator comprising:

a housing;

a stack comprising a plurality of formed members disposed within the housing, a portion of the stack comprising at least one formed member having at least a first structural state wherein the at least one formed member is concave in a first direction, the remainder of the stack comprising at least one other formed member having temperature dependent first and second structural states wherein the at least one other formed member is concave in first and second directions, respectively, adjacent formed members of the stack being in nesting engagement with each other over at least one range of ambient temperatures wherein the adjacent formed members are concave in the same direction, adjacent formed members of the stack also being in non-nesting engagement with each other over at least one other range of ambient temperatures wherein the adjacent formed members are concave in opposite directions, the at least one other formed member of the remainder of the stack comprising first and second kinds of snap-acting thermostatic bimetallic members, the first kind snapping from one to the other of its structural states at a first transition temperature, the second kind snapping from one to the other of its structural states at a second transition temperature, the at least one formed member of the portion of the stack comprising a plurality of passive members, each passive member having only a single temperature independent structural state, each bimetallic member being interposed between adjacent pairs of the passive members; and

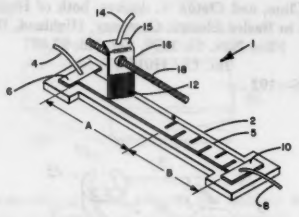
a follower movably supported by the housing, engaging one of the formed members and having a variable position depending upon the temperature dependent structural states of the stack of formed members.

4,345,235

VARIABLE RESISTANCE DEVICE HAVING A RESISTANCE ELEMENT WITH LASER CUTS

Richard E. Riley, Riverside, and Bradley D. Turner, Covina, both of Calif., assignors to Spectrol Electronics Corporation, City of Industry, Calif.

Filed Sep. 12, 1980, Ser. No. 187,251
Int. Cl.³ H01C *10/38*
U.S. Cl. 338—176 **2 Claims**



1. A variable resistance device comprising:

an electrically non-conducting substrate;

a layer of resistance material on the surface of the substrate forming a resistance path, said resistance material having at least one series of overlapping laser cuts in the edges of the resistance material generally transverse to the resistance path, said cuts being relatively small in width compared to the dimensions of the resistance path with each successive cut being in the edge opposite to the preceeding cut and with the length of each cut and the spacing between cuts selected to provide a desired non-linear resistance function along the resistance path;

a multi-fingered contact wiper which may move along and in contact with the resistance path to provide different resistance values when the wiper is in contact with different sections of the resistance path, said wiper oriented at an angle to the cuts in the resistance path so that deviations from the desired non-linear resistance function, due to the wiper crossing the cuts in the resistance path, are substantially eliminated;

a first electrical contact connected to the resistance material at one end of the resistance path; and

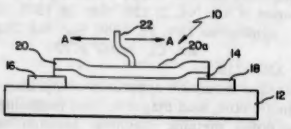
a second electrical contact connected to the resistance material at the end of the resistance path opposite to the end of the resistance path at which the first electrical contact is connected.

4,345,236

ABRASION-RESISTANT SCREEN-PRINTED POTENTIOMETER

Charles W. Eichelberger, Schenectady, and Robert J. Wojnarowski, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,344
Int. Cl.³ H01C *10/38*
U.S. Cl. 338—176 **17 Claims**



1. An abrasion-resistant potentiometer, comprising:

a substrate;

a first continuous resistive layer formed on said substrate and having a surface opposite to said substrate;

a second continuous and self-lubricating resistive layer formed substantially on the entire surface of said first resistive layer, the resistivity of said second resistive layer being substantially greater than the resistivity of said first resistive layer; and

a slide arm in pressure contact with said second resistive layer and slidably movable thereacross.

4,345,237

SUPERVISORY AND MONITORING SYSTEM FOR HELICOPTER PROPELLER BLADES

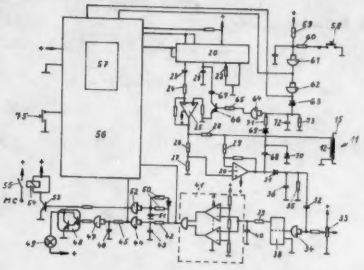
Ernst Lerche, Ritterhude; Bernward Raschke, and Siegfried Hartwig, both of Ganderkesee, all of Fed. Rep. of Germany, assignors to Verenigte Flugtechnische Werke GmbH, Bremen, Fed. Rep. of Germany

Filed Sep. 11, 1980, Ser. No. 186,310

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936761

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—27 R **14 Claims**



1. A system for monitoring rotor blades of a propeller wherein each rotor blade is associated with a sensitive transducer responding to a defect of the blade, there being a plurality of transducers accordingly, comprising:

a resonance circuit provided for rotating with the rotor and including a plurality of capacitors;

a plurality of switches respectively operated by said transducers of the plurality and connected to the capacitors of the plurality of capacitors for individually altering the resonance frequency of the resonance circuit so that a different resonance frequency exists for responses of different ones of the transducers and the respective resonance frequency is representative of the rotor blade being defective;

a pulse transformer having a primary being stationary relative to the rotor, and a single secondary rotating with the rotor, excentrically thereto, and being intermittently coupled to the primary pursuant to rotor rotation, the resonance circuit being connected to the single secondary winding as a load thereon;

a signal generator connected for feeding a signal to the primary;

circuit means including impedance means connected to the signal generator to respond to a change in the load upon response of at least one of said switches; and

indicating means connected to said impedance means to indicate such a change as an indication of a defect in at least one of the rotor blades.

4,345,238

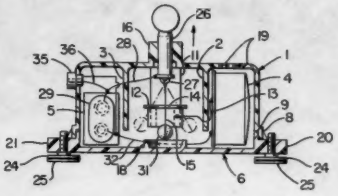
SIGNALLING DEVICE FOR USE IN AUTOMOTIVE AND LIKE VEHICLES

Richard L. Weir, 2217 Grant St., Dayton, Ohio 45406

Filed Sep. 8, 1980, Ser. No. 184,790

Int. Cl.³ B60Q *5/00*

U.S. Cl. 340—52 R **13 Claims**



1. A device for use in automotive vehicles for alerting the driver to improper and/or unsafe driving patterns, including a housing adapted to be mounted on a vehicle, a mechanism within said housing sensing driving excesses and signalling the occurrence of such excesses, at least a portion of said mechanism having means in connection therewith for the manipulation thereof to vary the sensitivity of the response of said mechanism to said excesses to suit driving conditions and individual driver requirements, and said manipulating means being exterior to said housing, facilitating its operation.

4,345,239

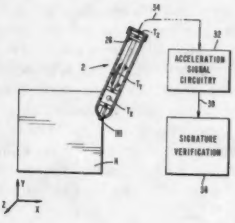
APPARATUS FOR DETERMINING PEN ACCELERATION

Brian J. Elliott, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 20, 1980, Ser. No. 161,483

Int. Cl.³ G06K *9/22*

U.S. Cl. 340—146.3 SY **5 Claims**



1. An apparatus for measuring pen acceleration for use in a signature verification system, comprising:

a pen having capacitive transducer means mounted therein for changing capacitance responsive to acceleration of said pen,

a Blumlein bridge circuit having an input and an output and having one arm thereof comprised of the capacitance of said capacitive transducer means,

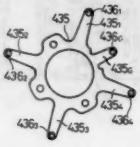
amplifier means having an input connected to the output of said Blumlein bridge circuit, and having an output for providing an amplified signal, and

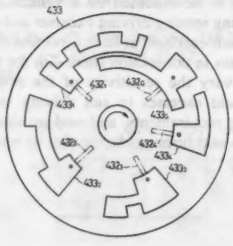
A.M. detector means for detecting the modulation on said amplified signal, which corresponds to said acceleration.

4,345,240
THROTTLE OPENING SENSOR

Hiroyuki Amano, Chiryu; Tsuyoshi Yoshida, Toyota, and Kazuhiko Shibata, Anjyo, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Aisin-Waner Kabushiki Kaisha, both of Aichi, Japan

Filed Jan. 29, 1980, Ser. No. 116,411
Claims priority, application Japan, Feb. 8, 1979, 54-15119[U]
Int. Cl.³ G08C *9/08*
U.S. Cl. 340—345 3 Claims





1. A throttle opening sensor comprising a printed circuit substrate having a plurality of angularly spaced apart split electrodes with each electrode having at least one radially outwardly projecting portion formed thereon and circularly disposed relative to each other, a resilient conductor having a plurality of radially extending arms equiangularly spaced apart with each arm having a contact which corresponds to only a respective split electrode, said contacts being circularly disposed for engagement with said projecting portions of said electrodes and a drive shaft for causing a limited angular movement less than 360° of one of the substrate and the resilient conductor relative to the other in mechanical association with a movement of the throttle valve as the latter is being opened or closed, the split electrodes being configured such that a code formed by a combination of contact or non-contact between the radially projecting outer portions of the individual split electrodes and the respective contacts exhibits a change in only one bit thereof for each angular movement of the drive shaft corresponding to one step of the throttle opening.

4,345,241
ANALOG-TO-DIGITAL CONVERSION METHOD AND APPARATUS

Sumio Takeuchi, Sakura; Rikichi Murooka, Kamagaya, and Jun Sakamoto, Kamakura, all of Japan, assignors to Sony/Tektronix, Tokyo, Japan

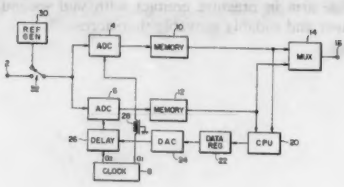
Filed Jan. 12, 1981, Ser. No. 223,979
Claims priority, application Japan, Feb. 18, 1980, 55/17805
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 CC 12 Claims

1. An analog-to-digital conversion apparatus, comprising:

a plurality of analog-to-digital converters arranged in parallel for converting an analog input signal into a digital signal;

clock signal generation means for driving said analog-to-digital converters at different phases to each other;

a reference signal generator for generating a reference signal to be digitized by said analog-to-digital converters; and

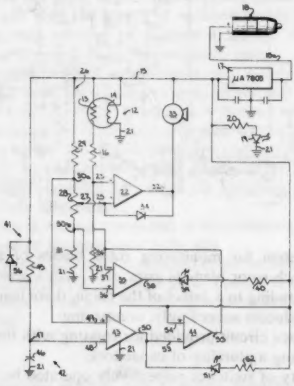


control means for controlling the phase relation of the clock signals from said clock signal generation means to be applied to each of said analog-to-digital converters in response to the outputs thereof when the reference signal is digitized.

4,345,242
GAS DETECTOR

Angelo Ienna-Balistreri, 1875 W. Sheridan Ave., Milwaukee, Wis. 53209

Filed Feb. 20, 1981, Ser. No. 236,528
Int. Cl.³ G08B *17/10*
U.S. Cl. 340—634 6 Claims



1. A gas detector, comprising

an alarm,

electrical power means connected to said alarm and to be selectively energized to operate the alarm for detector operation,

a gas sensor including a sensing portion to be exposed to the surrounding environment to detect concentrations of carbon monoxide gas and a heater having an input connected to said power means to provide heat to said sensing portion,

an enable circuit including timing means connected to said power means to provide a timed output in response to a predetermined time delay following the initial energization of said heater,

a comparator having an output means and a separate multiple signal input means and having means to compare the input signals and establish an output at said output means selectively transferable between a first condition to indicate a gas concentration below a predetermined magnitude and a second condition to activate said electrical power means to indicate a gas concentration above said

predetermined magnitude and said input means connected to receive

a first input from said enable circuit to disable said comparator for said predetermined time delay to prevent operation of said alarm while said heater is initially energized and

a second input from said gas detector to continuously monitor the carbon monoxide concentration to provide said second condition in response to the sensing of at least said predetermined magnitude gas concentration and

a third input from said comparator output to latch said comparator to continuously activate said alarm in response to the occurrence of said second condition, and

resetting means connected to selectively de-energize said electrical power means to de-activate said alarm and condition said gas detector for continued gas monitoring.

4,345,243
APPARATUS FOR GENERATING SIGNALS FOR PRODUCING A DISPLAY OF CHARACTERS

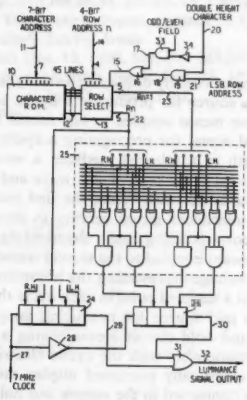
Robert Parsons, Cambs, England, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 2, 1980, Ser. No. 165,472

Claims priority, application United Kingdom, Jul. 24, 1979, 7925703

Int. Cl.³ G09G 1/16

U.S. Cl. 340—728 **11 Claims**



1. Apparatus for generating signals suitable for producing a display of characters on a raster scanned display means, the apparatus including a read-only memory having an address input for character codes and a data output for signals representing a character segment matrix pattern identified by a character corresponding to a character code applied to said address input; and a character rounding circuit including logic means responsive to signals representing a character segment matrix pattern derived from the read-only memory to produce signals representing additional partial character segments and means for combining the additional partial character segment signals with the character segment matrix signals derived from the read-only memory, means for operating the read-only memory to produce output signals in parallel representing the entire character segment matrix pattern of a character whose code is applied as address input thereto, and parallel gating means for selecting as the output of the read-only memory, output signals representing a selected row of the character segment matrix pattern simultaneously with output signals representing the immediately adjacent row of the character segment matrix pattern where it exists.

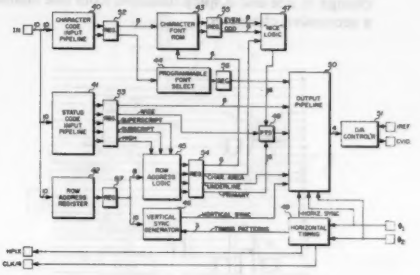
4,345,244
VIDEO OUTPUT CIRCUIT FOR HIGH RESOLUTION CHARACTER GENERATOR IN A DIGITAL DISPLAY UNIT

Douglas S. Greer, San Diego, Calif., and Paul Grunewald, Somerset, N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 15, 1980, Ser. No. 178,494

Int. Cl.³ G09G 1/16

U.S. Cl. 340—728 **10 Claims**



1. A system for displaying characters in a dot-matrix form, said system comprising:

a display unit having a display face and means to scan said display face in an interlaced scan mode;

storage means to store information signals representative of characters to be displayed, said storage means including a first store to hold information signals for even lines of the display and a second store to hold information signals for odd lines of the display, which even and odd line are to be displayed in said interlaced scan mode;

logic means coupled to said display unit and to said storage means to receive information signals from both of said first store and said second store and to generate extra bit signals for display during the particular scan being displayed whenever the information signals to be displayed form a diagonal;

output buffering means including a register coupled to said logic means to receive said information signals and said extra bit signals to be transmitted to said display unit;

input buffering means including a register coupled to said storage means to receive a character code representing a character to be displayed, said character code forming an address to said storage means;

first register means coupled between said storage means and said logic means for receiving said information signals from said storage means; and

second register means between said input buffering means and said storage means to receive said character code from said input buffering means at the same time said first register means is receiving said information signals from said storage means for the first preceding character code received by said first register means.

4,345,245
METHOD AND APPARATUS FOR ARRANGING SEGMENTED CHARACTER GROUPS IN A DIGITAL TYPESETTER

Louis C. Vella, Selden, and Walter I. Hansen, Cold Spring Harbor, both of N.Y., assignors to Eltra Corporation, Morristown, N.J.

Filed Nov. 26, 1979, Ser. No. 97,276

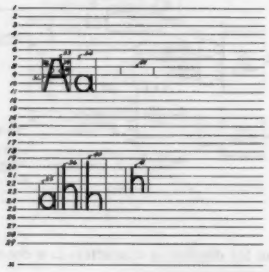
Int. Cl.³ G06F 3/14

U.S. Cl. 340—744 **23 Claims**

1. A method of rearranging the order of random size characters from an input sequence of characters to a raster line order

of characters, for display on respective raster lines of a raster display, said characters represented by character data arranged in an input sequence, said raster lines generated in a raster line order, 1 to N, and with said input sequence of characters being different from the order of said characters in the said respective raster lines for at least a plurality of characters in said input sequence, comprising the steps of:

(a) arranging in an input sequence, character data in a first store representing the identity, size, and display location of the characters to be formed on said raster display,

(b) examining the character data in said input sequence for a change in size and display location, from one character to a successive character,

(c) identifying segments of character data for successive characters in said input sequence, having a common display location and size, said segments being in said input sequence,

(d) said step of identifying segments including the step of identifying reference raster lines, within said raster line order 1 to N, related to a parameter of at least one character within respective segments, and recording said reference raster lines,

(e) rearranging the order of said segments according to the value of the reference raster lines for the respective segments and related to the said order of raster lines.

4,345,246

SYNCHRONIZATION DEVICE FOR A CHARACTER-GENERATING CIRCUIT AND A VERTICAL SCANNING CIRCUIT AND TELEVISION RECEIVER COMPRISING SUCH A DEVICE

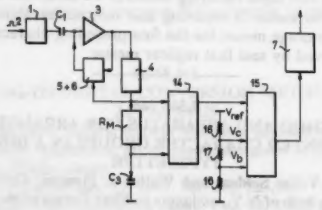
Michel van den Driessche, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 18, 1980, Ser. No. 160,453

Claims priority, application France, Jun. 20, 1979, 79 15804

Int. Cl.³ G09G *1/16*; H04N *5/22*

U.S. Cl. 340—748 **4 Claims**



1. A synchronization device for a character-generating circuit and a vertical scanning circuit of an image tube, the scanning circuit comprising a deflector coil and a threshold detector, wherein the synchronization control signal for the generating circuit is made dependent on the current flowing through the deflector via the threshold detector a first measuring input of which receives a voltage proportional to the current through the deflector and a second reference input receives a reference voltage, the threshold detector changing state when the voltage measured reaches the reference voltage, the output signal of the threshold detector forming the synchronization signal for the generating circuit.

4,345,247

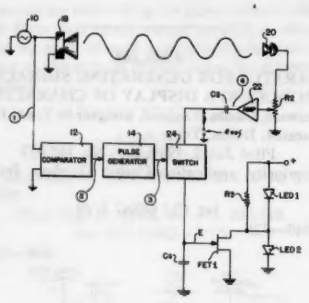
DISPLAY SYSTEM FOR STEADY STATE WAVES

William E. Thornton, and James F. Thornton, both of 701 Cowards Creek Rd., Friendswood, Tex. 77546

Filed Sep. 29, 1980, Ser. No. 191,398

Int. Cl.³ G09G *3/00*

U.S. Cl. 340—755 **9 Claims**



1. A system for visually displaying a steady state cyclic wave comprising: a source for producing a cyclic electrical signal; first transducer means coupled to said source to be driven by said electrical signal for propagating a cyclic wave along a particular path in a selected medium; a second transducer means positioned in the path of said wave and movable along the path towards and away from the first transducer means; said second transducer means serving to convert the cyclic wave into a corresponding cyclic electrical signal; sample and hold circuit means coupled to the second transducer means for producing a voltage representing the instantaneous amplitude of the wave at a sampled point in each cycle thereof; circuitry connected to said source for producing sampling pulses for said sample and hold circuit means having a predetermined fixed phase relationship with the cyclic electrical signal from said source; electrically energized display means; and drive circuit means connected to the sample and hold circuit means for producing a drive signal for the display means corresponding to the voltage produced by the circuit means.

4,345,248

LIQUID CRYSTAL DISPLAY DEVICE WITH WRITE-IN CAPABILITY

Seigo Togashi, and Akira Tsuzuki, both of Tokorozawa, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Dec. 12, 1980, Ser. No. 215,900

Claims priority, application Japan, Dec. 14, 1979, 54-162996

Int. Cl.³ G06F *3/02*

U.S. Cl. 340—784 **15 Claims**

1. A liquid crystal display device, comprising:

means for generating a plurality of drive signals;

at least two substrates;

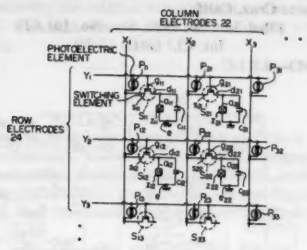
a layer of liquid crystal sandwiched between said substrates;

a plurality of electrodes formed upon said substrates;

a plurality of display elements controlled by said drive signals applied through said electrodes;

a plurality of switching elements provided upon a first one of said substrates;

a plurality of photoelectric elements provided upon said first one of said substrates; and



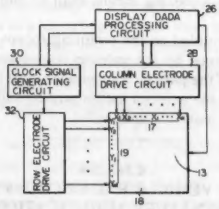
means for detecting variations in characteristics of said photoelectric elements resulting from changes in levels of light impinging thereon.

4,345,249

LIQUID CRYSTAL DISPLAY PANEL

Seigo Togashi, Tokorozawa, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Dec. 12, 1980, Ser. No. 215,901
Claims priority, application Japan, Dec. 25, 1979, 54-167542
Int. Cl.³ G06F *3/02*
U.S. Cl. 340—784 **8 Claims**


DISPLAY DADA PROCESSING CIRCUIT
CLOCK SIGNAL GENERATING CIRCUIT
COLUMN ELECTRODE DRIVE CIRCUIT
ROW ELECTRODE DRIVE CIRCUIT

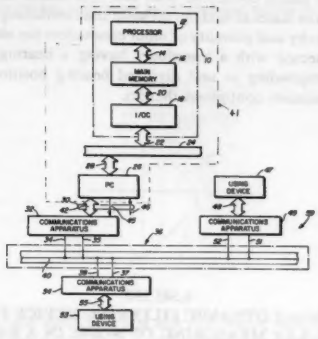
1. In a liquid crystal display panel having a layer of liquid crystal material enclosed between a pair of substrates, a set of row electrodes and a set of column electrodes formed on said substrates to mutually intersect, a plurality of display electrodes arranged in positions corresponding to intersections of said row and column electrodes, a plurality of switching elements each coupled between an intersection of said row and column electrodes and a corresponding one of said display electrodes, a source of scanning signals for selectively rendering said switching elements conductive and a source of display signal voltages, said display signal voltages being selectively applied to said display electrodes through said switching elements in response to said scanning signals, and a reference electrode which is held at a predetermined potential, the improvement whereby said display electrodes are arranged in relationship to said reference electrode such that an electric field is applied to said liquid crystal material in a direction having at least a component directed parallel to the plane of said substrates in response to a potential difference between said display signal voltage applied to one of said display electrodes and the potential of said reference electrode.

4,345,250

INFORMATION COMMUNICATION SYSTEM WITH COLLISION AVOIDANCE

Herbert K. Jacobsthal, Scottsdale, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Dec. 22, 1980, Ser. No. 219,150
Int. Cl.³ H04Q *9/00*
U.S. Cl. 340—825.5 **20 Claims**



1. An information communication system comprising:

a. a communication medium;

b. a plurality of transceivers connected to said medium, each transceiver including transmitter for transmitting an information signal onto said medium, and receiver for receiving a transmitted information signal communicated on said medium by another transceiver; and

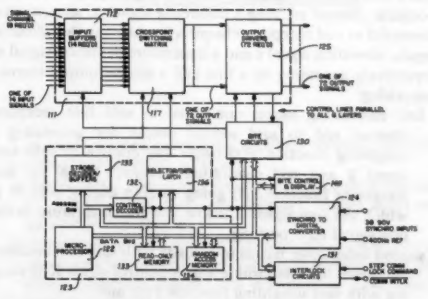
c. at least one of a plurality of collision avoidance apparatus connected to each transceiver of said transceivers for selectively applying a unique predetermined DC voltage level prior to said transmitter transmitting onto said medium to determine if another transceiver is preparing to transmit.

4,345,251

SOLID STATE COMMUTATOR SWITCH

Robert H. Begeman; Barry D. Sanderson; Donald C. Weiss, all of Indianapolis, and David L. Zeph, Westfield, all of Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 20, 1981, Ser. No. 236,474
Int. Cl.³ H04Q *9/00*; G06J *1/00*; G01C *17/00*
U.S. Cl. 340—825.86 **8 Claims**



1. A solid state switching system for connecting a plurality of input signals to a plurality of selected transducer elements comprising,

a plurality of input conductors,

a plurality of transducer elements positioned in a circular array,

a crosspoint switching matrix having a plurality of on/off solid state switching elements for connecting any of said input conductors to any of said transducer elements,

first means for selectively producing a binary number indicative of a digitized bearing position, and

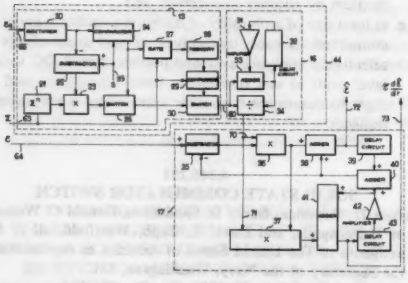
control means connected with said first means for controlling the states of said on/off solid state switching elements whereby said plurality of input conductors are electrically connected with a transducer having a bearing position corresponding to said digitized bearing position and to transducers contiguous thereto.

4,345,252

NON-LINEAR DYNAMIC FILTERING DEVICE FOR THE ANGULAR MEASURING OF NOISE IN A RADAR

Roland Carre, and Georges Doriath, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Feb. 7, 1980, Ser. No. 119,397
Claims priority, application France, Feb. 13, 1979, 79 03640
Int. Cl.³ G01S *13/44*
U.S. Cl. 343—5 NQ **10 Claims**



1. A circuit arrangement for improving the accuracy of angular measurements in an echo-type target-locating system with a first reception channel emitting a sum signal Σ, a second reception channel emitting a difference signal Δ, and circuitry connected to said reception channels for deriving therefrom an angular-deviation signal ϵ and a quadrature deviation signal ϵq respectively appearing on a first and a second output thereof, comprising:

first calculating means connected to said first reception channel and to said second output for generating a weighting function P(t) under the control of said sum signal Σ and said quadrature deviation signal ϵq, said weighting function P(t) going to zero during periods in which the sum signal Σ is low and the quadrature deviation signal ϵq is peaking;

second calculating means in cascade with said first calculating means for establishing a gain-control signal K(t) varying with said weighting function P(t); and

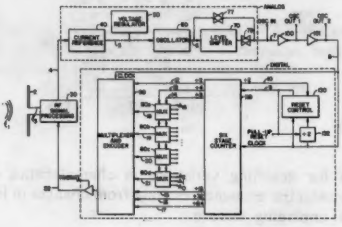
dynamic filter means connected to said second calculating means and to said first output for processing said angular-deviation signal ϵ by multiplying same with said gain-control signal K(t) and subjecting the product to recursive filtering.

4,345,253

PASSIVE SENSING AND ENCODING TRANSPONDER

D. Robert Hoover, Santa Cruz, Calif., assignor to Identronix, Inc., Santa Cruz, Calif.

Filed Jun. 20, 1980, Ser. No. 161,622
Int. Cl.³ G01S *13/80*
U.S. Cl. 343—6.8 LC **15 Claims**



1. A passive transponder comprising:

antenna means for receiving and transmitting signals;

oscillating means for generating a signal of a first frequency in response to signal received by the antenna means;

counting means connected to receive the signal from the oscillating means and to provide output signals at selected frequencies integrally divisible into the first frequency;

at least one multiplexing sequencing means having a series of input terminals, selected ones of which are altered to provide an identification code, the at least one multiplexing sequencing means being connected to receive signals from the counting means and the oscillating means;

encoding mens connected to the oscillating means, the counting means, the at least one multiplexing sequencing means, and the antenna for selecting which of the signals from the oscillating means, the counting means, and the at least one multiplexing means shall be supplied to the antenna; and

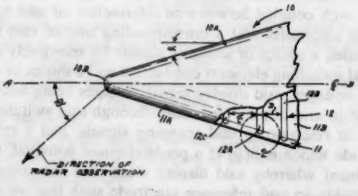
reset means coupled to the counting means for sensing the signals received by the antenna means and inhibiting the operation of the passive transponder until the signals being received by the antenna means possess sufficent energy to operate the passive transponder.

4,345,254

REENTRY VEHICLE RADAR CROSS SECTION SIGNATURE MODIFICATION

Edward N. Skomal, Redlands, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 1, 1975, Ser. No. 563,261
Int. Cl.³ H01Q *15/00*
U.S. Cl. 343—18 B **8 Claims**



1. In a reentry vehicle having a geometric axis and an integrated heatshield made of porous dielectric material, wherein the heatshield has an external ablating surface layer and an internal non-ablating surface layer, and wherein the reentry vehicle is of the type not having a metallic substructure contig-

uous to and internal of the heatshield, the improvement comprising a plurality of zones having depth, width, and length and made of electrically conductive material disposed on and partially penetrating the internal non-ablating surface layer of the heatshield, with said zones spaced non-uniformly with respect to said axis.

4,345,255

ANTENNA FEED SYSTEM

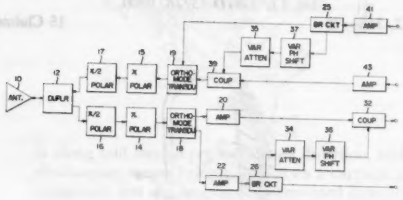
Keigo Komuro; Matsuichi Yamada, both of Tokyo; Katsuhiko Aoki, Amagasaki; Yoshihiko Yoshikawa, Amagasaki; Fumio Itoh, Amagasaki; Fumio Takeda, and Osami Ishida, both of Kamakura, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd. and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Dec. 19, 1979, Ser. No. 105,741

Claims priority, application Japan, Dec. 25, 1978, 53-160607; Mar. 2, 1979, 54-24743

Int. Cl.³ H04B *7/00*

U.S. Cl. 343—100 PE **8 Claims**



1. An antenna feed system for coupling a receiver unit to a receiving antenna for receiving a pair of elliptically polarized waves having the same frequency spectrum and rotated in opposite relationship with each other; which system comprises polarizer unit means for transforming one of said elliptically polarized waves included in a received output from said receiving antenna to a linearly polarized wave having a predetermined plane of polarization, an ortho-mode transducer connected to said polarizer unit means at its output and including a pair of first and second outputs, said ortho-mode transducer delivering a first electromagnetic wave having the same plane of polarization as said linearly polarized wave to said first output thereof and a second electromagnetic wave having a plane of polarization orthogonal to that of said linearly polarized wave to said second output thereof, a transfer circuit electrically connected to said second output of said ortho-mode transducer to impart controllably an attenuation and a phase lag to one portion of said second electromagnetic wave, and a coupler for combining said modified portion of said second electromagnetic wave from said transfer circuit with said first electromagnetic wave from said first output of said ortho-mode transducer, whereby a pair of received outputs are provided from said second output of said ortho-mode transducer and from said coupler respectively.

4,345,256

STEERABLE DIRECTIONAL ANTENNA

Lawrence L. Rainwater, Sunnyvale, Calif., assignor to Sperry Corporation, New York, N.Y.

Filed Dec. 15, 1980, Ser. No. 216,455

Int. Cl.³ H01Q *19/08, 3/08*

U.S. Cl. 343—754 **5 Claims**

1. A steerable antenna assembly comprising:

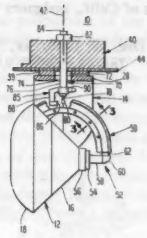
directional antenna means;

first support means attached to said directional antenna means for rotating said directional antenna means about a first axis of rotation;

second support means formed to have said first support means mounted therewith for supporting said first support means;

a coaxial feed line for transmitting RF energy, said feed line having a center conductor with a probe portion connected to one end of said center conductor, said coaxial feed line mounted to said second support means;

wave guide feed line means having a slot formed therein and electrically connected at one end to said directional antenna means, said wave guide feed line means formed to be



rotatable about said first axis of rotation, said wave guide feed line means further disposed to have said center conductor extend through said slot whereby said probe is disposed within said wave guide for every angle of rotation of said directional antenna about said first axis; and

reflecting means connected to said coaxial feed line and partially disposed within said wave guide feed line means for cooperating with said probe portion and said guide feed line means to couple efficiently RF energy between said directional antenna means and said coaxial feed line.

4,345,257

PRIMARY RADAR ANTENNA HAVING A SECONDARY RADAR (IFF) ANTENNA INTEGRATED THEREWITH

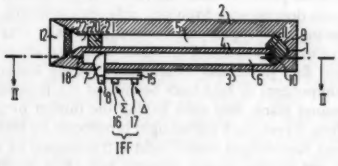
Anton Brunner, Wangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 20, 1980, Ser. No. 151,737

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1979, 2925063

Int. Cl.³ H01Q *13/00*

U.S. Cl. 343—780 **21 Claims**



1. A radar antenna comprising: a pillbox antenna including a cylindrical parabolic reflector,

an upper metal plate and a lower metal plate perpendicular to and extending from said reflector spaced apart and parallel to one another,

an intermediate plate spaced between and parallel to said upper and lower plates and forming therewith upper and lower interplate spaces, said intermediate plate spaced from said reflector,

a primary radar signal radiator coupled to said lower interplate space with its radiation center on the focal line of said reflector, and

deflection means in said interplate spaces adjacent said

reflector for deflecting radiation from said lower interplate space to said upper interplate space; and

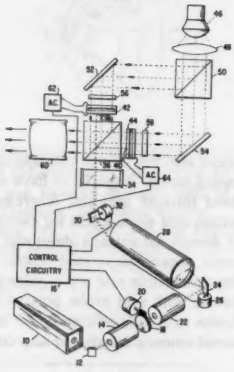
coupling means comprising a pair of identification-friend-foe (IFF) radiators arranged on opposite sides of said primary radar signal radiator and coupled to said lower interplate space for incoupling IFF signals.

4,345,258

COLOR DISPLAY SYSTEM

Robert C. Tsai, Montebello, and William J. Kidwell, North Hollywood, both of Calif., assignors to The Singer Company, Stamford, Conn.

Filed Dec. 15, 1980, Ser. No. 216,331
Int. Cl.³ G01D *9/32*
U.S. Cl. 346—17 **7 Claims**



1. A recording and projection system comprising:

a laser providing a substantially single frequency beam of coherent energy having a wavelength outside the range of wavelengths of visible light;

means for focusing said laser beam;

controllable polarization means interposed in the path of said laser beam for selectively controlling the polarization of said laser beam within a range between a first plane of polarization and a second plane of polarization so as to control the distribution of laser energy in said first and second planes of polarization;

a dichroic polarizer cube interposed in the path of said laser beam downstream from said polarization means, said cube having the property that it is substantially totally reflective to components of said laser beam that are polarized in said first plane and substantially totally transmissive to components of said laser beam that are polarized in said second plane, said cube having the further property that short wavelength visible light is reflected by said cube and long wavelength visible light is transmitted by said cube;

first and second locally erasable recording mediums positioned at the focal points of the reflected and transmitted laser beams, respectively;

deflecting means upstream from said polarizer cube for scanning said reflected and transmitted laser beams across said first and second recording mediums, respectively;

modulating means upstream from said deflecting means for modulating the intensity of said laser beam;

means for selectively erasing said first and second recording mediums;

means for providing a beam of white projection light;

a dichroic element interposed in said projection beam having dichroic properties substantially identical to the further property of said polarizer cube, said element producing from said beam of white light a beam of long wavelength visible light that is transmitted through said element and a beam of short wavelength visible light that is reflected by said element;

means for back lighting said first recording medium with said long wavelength visible light beam to form a long wavelength image;

means for back lighting said second recording medium with said short wavelength visible light beam to form a short wavelength image;

a first colored filter interposed in said long wavelength visible light beam;

a second colored filter interposed in said short wavelength visible light beam;

means for combining said long and short wavelength visible light beams to form a combined wavelength image; and

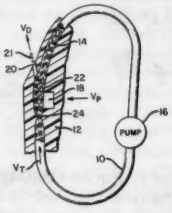
means for projecting said combined wavelength image.

4,345,259

METHOD AND APPARATUS FOR INK JET PRINTING

Peter H. Reitberger, Munich, Fed. Rep. of Germany, assignor to NCR Corporation, Dayton, Ohio

Filed Sep. 25, 1980, Ser. No. 190,773
Int. Cl.³ G01D *15/18, 9/00*
U.S. Cl. 346—75 **15 Claims**



7. Apparatus for non-impact printing in dot matrix manner on record media comprising

conduit means carrying printing ink in a closed environment system,

pump means operably associated with said system for circulating said ink under pressure along a path in continuous stream manner,

cavity means downstream of said circulating means enabling movement of ink out of said stream path,

an

outlet from said cavity means defining a nozzle through which ink is ejected and formed into droplets,

and

means comprising a deflection element adjacent the ink stream and pulsed in timed manner for generating pressure waves generally perpendicular into and through the stream path for causing ink to be moved therefrom toward and through said nozzle.

4,345,260

INK JET PRINTER WITH CARRIAGE VELOCITY COMPENSATION

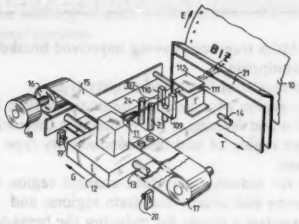
Jacques Deproux, Sevres, France, assignor to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France

Filed Oct. 3, 1980, Ser. No. 193,820
Claims priority, application France, Mar. 13, 1980, 80 05674
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **6 Claims**

1. An ink jet printing device comprising:

means for discharging ink towards a printing medium in a series of droplets, said ink jet discharging means including at least a first ink generator having an orifice for discharging at least some of the droplets in the series, driving means for providing relative movement between the ink

discharging means and the printing medium along a first predetermined direction of movement parallel to the printing medium, said driving means being operative to provide relative movement between the ink discharging means and the printing medium along said first predetermined direction alternating with relative movement along a second predetermined direction, means for compensating for the relative movement between the ink discharging means and the printing medium by imparting at least some of the droplets in the series with a velocity component in a direction opposite the direction of relative movement between the ink discharging means and the printing medium when said relative movement is along said first predetermined direction and when said relative movement



is along said second predetermined direction, said ink jet discharging means being mounted on a carriage movable along said first and second predetermined directions, said discharging means being aligned along a plane perpendicular to said predetermined directions, and the means for compensating comprising

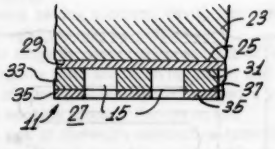
first and second deflecting electrodes mounted on said carriage and disposed proximate the orifice of said ink generator and on opposite sides of a discharge path of said series of droplets, and means for selectively and alternately energizing said electrodes with a voltage of instant magnitude, said energizing means being operable to energize the electrode of said deflecting electrodes which, when energized, deflects the ink jet in a direction opposite from the relative movement of the carriage.

4,345,261

DIELECTRIC RECORDING MEDIUM

Richard L. Wilkinson, Torrance, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Filed Feb. 21, 1979, Ser. No. 13,706
Int. Cl.³ H04N 5/76; G01D 15/34
U.S. Cl. 346—76 L **29 Claims**



1. An information recording medium for use with a recording apparatus wherein a write beam of radiation having a prescribed wavelength and having an intensity modulated by information to be recorded is directed at the recording medium as the medium is moved with respect thereto, whereby a succession of pits representative of the information is formed in a prescribed pattern on the medium, said recording medium comprising:

a substrate having an upper light-reflective surface;

a layer of light-absorptive dielectric material overlaying the light-reflective surface of said substrate and having a prescribed thickness approximately equal to an odd integral multiple of one-fourth the wavelength of the write beam of radiation in the dielectric material; and

a layer of metallic material overlaying the light-absorptive layer and having a lower light-reflective surface, said metallic layer being positioned to receive the intensity-modulated write beam of radiation and to transmit the beam to the dielectric layer, and being sufficiently thin to absorb only a small proportion of the radiation transmitted therethrough,

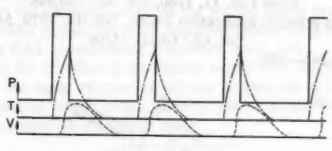
wherein a substantial proportion of the intensity-modulated write beam of radiation is transmitted through said metallic layer into said dielectric layer where, due to repeated internal reflections at the respective boundaries between the dielectric layer and the substrate and between the dielectric layer and the metallic layer, it is confined until a sufficient proportion of the beam is absorbed to vaporize selected portions of the dielectric layer, the vaporized material carrying with it the corresponding portions of the overlaying metallic layer, whereby the succession of pits is formed in the dielectric and metallic layers of the medium.

4,345,262

INK JET RECORDING METHOD

Yoshiaki Shirato, Yokohama; Yasushi Takatori, Sagamihara; Toshitami Hara, Tokyo; Yukuo Nishimura, Sagamihara, and Michiko Takahashi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 7, 1980, Ser. No. 119,453
Claims priority, application Japan, Feb. 19, 1979, 54/18796; Mar. 6, 1979, 54/25929; Apr. 2, 1979, 54/39531
Int. Cl.³ G01D 15/18
U.S. Cl. 346—140 R **15 Claims**



1. An ink jet recording method which comprises:

(a) contacting or bringing closer an electro-thermal transducer with or to a recording liquid in an operating chamber having a discharge orifice;

(b) introducing into the electro-thermal transducer an input pulse signal with its pulse width being in a range of from 0.1 μsec. to 500 μsec., said input pulse signal being introduced in such a manner that its input cycle becomes at least three times as large as said pulse width;

(c) discharging said recording liquid from said discharge orifice in the form of a fine droplet in accordance with the operating force developed by the input of said pulse signal within said operating chamber; and

(d) effecting image recording on the surface of a recording medium with the liquid droplets.

4,345,263

RECORDING APPARATUS

Shigemitsu Tazaki, Matsudo, and Hiroshi Kyogoku, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

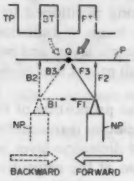
Filed Sep. 4, 1980, Ser. No. 183,948
Claims priority, application Japan, Sep. 10, 1979, 54-115994
Int. Cl.³ G01D 15/18
U.S. Cl. 346—140 R **2 Claims**

1. Recording apparatus comprising:

linear motor means;

ink jet means for ejecting liquid droplets, said ink jet means adapted for reciprocal movement by said linear motor means; and

means for varying the timing of ejection of liquid droplets



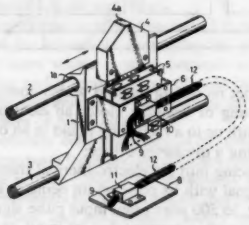
between the reciprocal movement of said ink jet means in a first direction and the reciprocal movement of said ink jet means in a second direction, wherein said means for varying the timing of ejection of liquid droplets avoids printing distortion in either direction.

4,345,264

CARRIAGE SUPPORT FOR RECORDING HEAD, DIODE MATRIX, AND DRIVERS

Kazuyuki Hara, Yokohama, Japan, assignor to Ricoh Co. Ltd., Japan

Filed Feb. 11, 1980, Ser. No. 120,546
Claims priority, application Japan, Feb. 16, 1979, 54-15984
Int. Cl.³ G01D *15/06*
U.S. Cl. 346—154 **5 Claims**



1. A recording system of the type for carrying out electrostatic recording, electrostatic printing or electric perforating in a predetermined pattern on a recording medium comprising:

a carriage capable of linear reciprocatory movement;

means for driving said carriage;

a recording head supported on said carriage including at least one stylus disposed in close proximity to the recording medium;

circuit means for applying high potential to said stylus to produce an electrical discharge to an opposed common electrode;

means for supporting on said carriage at least a diode matrix, and at least one of line-direction drivers and row-direction drivers of said diode matrix comprising circuit elements; and

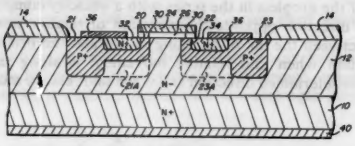
leads for electrically connecting the circuit elements supported on said carriage to other circuit elements supported on a stationary member of the recording system.

4,345,265

MOS POWER TRANSISTOR WITH IMPROVED HIGH-VOLTAGE CAPABILITY

Richard A. Blanchard, Los Altos Hills, Calif., assignor to Supertex, Inc., Sunnyvale, Calif.

Filed Apr. 14, 1980, Ser. No. 139,654
Int. Cl.³ H01L *29/78*
U.S. Cl. 357—23 **15 Claims**



1. An MOS transistor having improved breakdown characteristics comprising:

a drain region of first conductivity type;

a body region of a second conductivity type in said drain region and forming a P—N junction therewith;

a source region of said first conductivity type in said body region;

a gate for inducing a surface channel region in said body between said source and drain regions; and

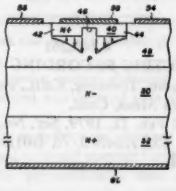
low impedance means for reducing the breakdown voltage of said P—N junction away from said channel region, said means including a second region of said second conductivity type merged with said body region and extending further into said drain region than does said body region.

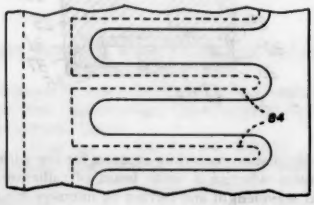
4,345,266

TRANSISTOR HAVING IMPROVED TURN-OFF TIME AND SECOND BREAKDOWN CHARACTERISTICS WITH BI-LEVEL EMITTER STRUCTURE

King Owyang, Baldwinsville, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Continuation of Ser. No. 926,450, Jul. 20, 1978, abandoned. This application Feb. 19, 1981, Ser. No. 236,220
Int. Cl.³ H01L *29/72*
U.S. Cl. 357—34 **1 Claim**





1. In a semiconductor switching transistor constituted by a semiconductor body having a major face inset into which is a comb-shaped emitter region including a longitudinal spine portion from which laterally extends a plurality of finger portions arranged for interdigitation with a base region, said emit-

ter region being arranged to define with the base region a PN junction terminating in said major face, the improvement for increasing switching speed comprising

said emitter spine portion and emitter finger portions having edge portions connected to form a continuous peripheral portion extending from said major face into said semiconductor body to a termination at said PN junction at a first depth below said major face,

said emitter spine portion and emitter finger portions further having a common interior portion bordered by said peripheral portion and extending from said major face into said semiconductor body to a termination with said PN junction at a second depth below said major face less than said first depth,

and an emitter electrode directly contacting said major face over the entirety of said interior portion and part of said peripheral portion.

4,345,267

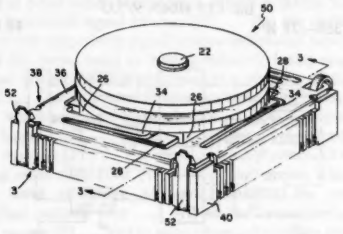
ACTIVE DEVICE SUBSTRATE CONNECTOR HAVING A HEAT SINK

Ned E. Corman, Harrisburg; Steven J. Kandybowski, Tower City; William S. Scheingold, Palmyra, and Frank C. Youngfleish, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 31, 1980, Ser. No. 136,017

Int. Cl.³ H01L *23/02, 23/42, 23/44*

U.S. Cl. 357—81 **1 Claim**



1. An active device substrate connector incorporating a heat sink, comprising:

a. a housing having a central cavity into which an active device substrate may be positioned;

b. a cover hingedly connected to one side of the housing for covering the substrate-receiving cavity and having a plurality of spring fingers spaced around a centrally positioned opening through the cover; and

c. a heat sink of thermally conductive material comprising:

i. a base plate removably positionable in between the inside of the cover when closed over the housing and a substrate which may be positioned in the cavity, said spring fingers on the cover bearing against the plate to retain it in the housing and to bias it against the substrate;

ii. a heat-exchanger consisting of a plurality of vertically stacked discs; and

iii. means for mechanically and thermally removably connecting the heat exchanger to the base plate through the cover opening.

4,345,268

PROCESSING CIRCUIT FOR COLOR TELEVISION SIGNALS

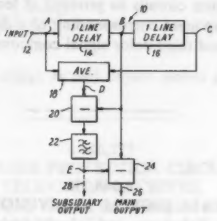
Christopher K. P. Clarke, Crawley, England, assignor to British Broadcasting Corporation, London, England

Continuation of Ser. No. 24,519, Mar. 28, 1979, abandoned. This application Jan. 26, 1981, Ser. No. 228,547

Claims priority, application United Kingdom, Mar. 29, 1978, 12294/78

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—31 **7 Claims**



1. A signal processing circuit for processing an input signal in a PAL colour television system, comprising:

an input terminal adapted to receive a PAL system input signal;

means connected to the input terminal and responsive to said input signal for providing (i) a first signal being the input signal delayed by one line period and (ii) a second signal being the resultant of the average of the delayed input signal and the input signal delayed by two line periods, which average predominantly comprises luminance, subtracted from the first signal, which second signal predominantly comprises chrominance;

means for band-pass filtering the second signal to provide a filtered signal, the filter pass-band comprising essentially the PAL chrominance frequency band; and

means for combining the filtered signal with the first signal at the same relative amplitude to provide a luminance signal in which comb filtering action is confined to the chrominance frequency band.

4,345,269

IMAGE PICK-UP APPARATUS

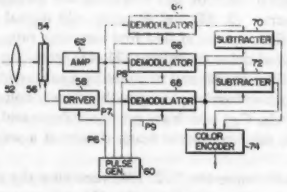
Yasuo Takemura, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 29, 1980, Ser. No. 144,918

Claims priority, application Japan, May 7, 1979, 54-55593

Int. Cl.³ H04N *9/07*

U.S. Cl. 358—43 **4 Claims**



1. An image pick-up apparatus comprising:

a solid state image pick-up device having a plurality of picture element areas;

color separation means for separating an incident light into a first color light, a second color light, and a third color light, wherein the third color light includes a first color light component corresponding to said first color light and a second color light component;

a color signal extracting circuit for extracting a color signal including first to third color signal components corresponding to said first to third color lights from those picture element areas of said solid state image pick-up device which have respectively received said first to third color lights;

first to third demodulation circuits connected to said color signal extracting circuit to respectively produce first to third output signals which respectively correspond to said first to third color signal components; and

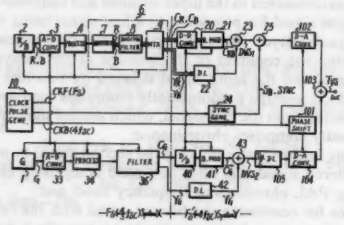
a first operation circuit connected to said first and third demodulation circuits to produce at least a fourth color signal component corresponding to a difference between said first and third color signal components.

4,345,270

SOLID STATE DIGITAL TELEVISION CAMERA

Fumio Nagumo, Yokohama, and Takashi Asaida, Atsugi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 27, 1981, Ser. No. 228,981
Int. Cl.³ H04N 9/07
U.S. Cl. 358—44 **8 Claims**



1. A solid state digital television camera having a solid state image sensing device from which dot sequential picture signals are obtained, said camera comprising:

a. a solid state image sensing device (**1, 2**) for picking up a picture and producing electrical video signals, said device being driven at a first sampling rate,

b. an A-D converter (**3, 33**) receiving the output of said solid state image sensing device (**1, 2**) and converting said picked-up video signals to digital video signals at said first sampling rate,

c. a digital filter (**6, 36**) receiving the output of said A-D converter (**3, 33**) and filtering said digital video signals said filter driven at said first sampling rate,

d. a digital color modulator (**21, 41**) receiving the output of said filter (**6, 36**) and modulating a subcarrier signal in the respective carrier phases with primary color components (C_R, C_B, C_G) which are produced from said filter individually, said modulator being driven at a second sampling rate;

e. a D-A converter (**102, 104**) receiving the output of said digital color modulator (**21, 41**) and converting the outputs of said digital color modulator to analog video signals at said second sampling rate; and

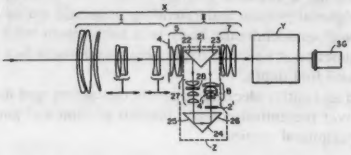
f. a D-D converter (**20, 40**) connected between said digital filter (**6, 36**) and said digital color modulator (**21, 41**) for converting the sampling rate of said primary color component signals from said first sampling rate to said second sampling rate and said second sampling rate is higher than said first sampling rate.

4,345,271

TELEVISION CAMERA

Takeshi Sekiguchi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1980, Ser. No. 199,264
Claims priority, application Japan, Oct. 24, 1979, 54-137236; Oct. 24, 1979, 54-137237
Int. Cl.³ H04N 9/10
U.S. Cl. 358—55 **12 Claims**



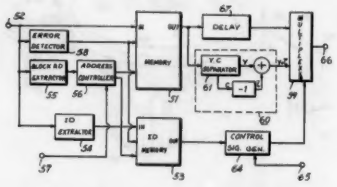
1. A television camera comprising an objective lens for receiving light from a scene, said objective lens having front lens means and rear lens means located at the image side of said front lens means; photosensitive converting means for sensing at least one image formed by said objective lens; and projection means including a test chart for providing the image of said test chart to said photosensitive converting means, said projection means further including a first optical path for conducting the light which has passed through said front lens means to said test chart and a second optical path for conducting the light from said test chart to said rear lens means.

4,345,272

VIDEO SIGNAL PROCESSING APPARATUS

Norihisa Shirota, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 30, 1980, Ser. No. 192,367
Claims priority, application Japan, Oct. 5, 1979, 54-129254
Int. Cl.³ H04N 9/535
U.S. Cl. 358—21 R **11 Claims**



1. Apparatus for processing a PAL color video signal including luminance and chrominance components and being composed of successive frames each having a plurality of fields constituted by successive respective lines which are interlaced in a pictorial representation of the complete frame, said apparatus comprising:

memory means having an input for receiving the video signal and a capacity suitable for the temporary storage of a field of said video signal;

means for causing the writing of the video signal received by said memory means at an address in the latter at which there was earlier written the video signal for a line of the next previous field which, in said pictorial representation of the complete frame, is positioned immediately below the line of the video signal being received;

means for detecting an error in the video signal being received and for inhibiting the writing in said memory means of the error-containing video signal;

means for reading out the video signal stored in said memory means;

means for inverting the phase of the chrominance compo-

nent of said video signal read out from the memory means; and

means for adding the phase-inverted chrominance component to the luminance component of the video signal read out of said memory means upon the detection of an error.

4,345,273

BROAD BAND SWITCHING SYSTEM

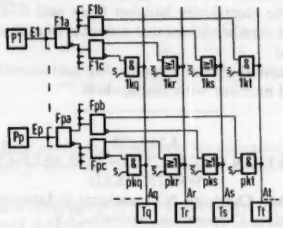
Udo Barabas; Karl-Heinz Moehrmann, and Hans-Marlin Christiansen, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 4, 1980, Ser. No. 203,980

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1979, 2944784

Int. Cl.³ H04N *7/18;* **H04B** *9/00*

U.S. Cl. 358—86 **2 Claims**



1. A broad band switching system for the selective connection of broad band signal sources, particularly television program sources, to subscribers receiving broad band signals, said system comprising a broad band switching network via which the broad band signals, particularly television signals, are transmitted as pulse modulated signals, means whereby the signals of the individual signal sources (Pl . . . Pp) are multiply supplied to the respective signal source-individual input (El . . . Ep) of the broad band switching network, being respectively supplied in time-division multiplex in a plurality of time channels (Z1 . . . Z4) of a time-division multiplex system encompassing at least these time channels (Z1 . . . Z4), said plurality of time channels (Z1 . . . Z4) corresponding to the number (4) of signal sources (Pl . . . Pp) simultaneously connectible to one and the same subscriber (Tl . . . Tt), and means whereby the broad band switching network connects the subscriber-individual outputs (Aq . . . At) to the respectively desired signal source (Pl . . . Pp) in subscriber-individually determined time channels (Z1 . . . Z4) of the said plurality of time channels (Z1 . . . Z4).

4,345,274

OBJECT IDENTIFICATION SYSTEM UTILIZING CLOSED CIRCUIT TELEVISION

Joseph E. Bambara, North Babylon, N.Y., assignor to Servo Corporation of America, Hicksville, N.Y.

Filed Oct. 8, 1980, Ser. No. 195,102

Int. Cl.³ H04N *7/18*

U.S. Cl. 358—108 **10 Claims**

1. An object identification system for permitting visual observation, through a television camera, of an object travelling along a portion of a fixed path, said system comprising:

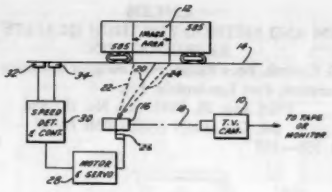
a television camera;

an effective optic axis of said television camera directed at said object path of travel through an optic axis bending element;

an optic axis bending element positioned along said optic axis;

means for determining the speed of said object;

and means responsive to said speed determining means for rotating said optic element at an angular velocity related to the speed of said object so as to bend said optic axis to follow said object as said object moves along said path portion.



4,345,275

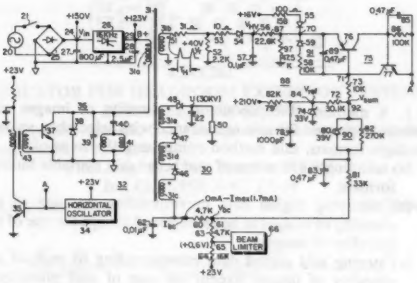
HIGH VOLTAGE PROTECTION CIRCUIT FOR A TELEVISION RECEIVER

George C. Waybright, Carmel, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 16, 1981, Ser. No. 225,811

Int. Cl.³ H04N *5/68*

U.S. Cl. 358—243 **30 Claims**



1. A protection circuit for a television display requiring an ultor voltage and drawing ultor beam current from an ultor terminal, comprising:

a source of alternating voltage;

a high voltage generator responsive to said alternating voltage for developing said ultor voltage at said ultor terminal;

means responsive to said ultor voltage for developing a sense voltage representative thereof;

means responsive to said ultor beam current for developing a sense voltage representative thereof;

a comparator;

means coupled to said comparator for developing a disabling signal when energized by said comparator;

means coupled to said disabling signal developing means for applying said disabling signal to said television display such that an abnormal display is produced when said disabling signal developing means is energized;

means for applying said ultor voltage sense voltage to said comparator to activate said comparator so as to develop said disabling signal when said ultor voltage exceeds a predetermined level;

means for applying said ultor beam current sense voltage to said comparator so as to vary said predetermined level with variations in said ultor beam current sense voltage; and

a switch coupled to said comparator and responsive to an overcurrent fault condition in said television display, said switch changing states when said overcurrent fault condi-

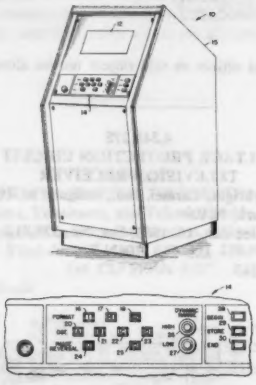
tion occurs to activate said comparator and produce an abnormal display.

4,345,276

SYSTEM AND METHOD FOR HIGH QUALITY IMAGE REPRODUCTION

Denis G. Colomb, Boca Raton, Fla., assignor to Sonics Research Corporation, Fort Lauderdale, Fla.

Filed Aug. 29, 1980, Ser. No. 182,886
Int. Cl.³ H04N *1/20*; G03B *19/00*
U.S. Cl. 358—258 **13 Claims**



1. A method of reproducing a plurality of images on a printer in printed form in accordance with selectable, variable multiple formats, said method comprising the steps of:

(a) selecting a given one of said selectable, variable multiple formats;

(b) receiving digital data corresponding to each of said plurality of images to be reproduced except for one of said plurality of images;

(c) storing said digital data corresponding to each of said plurality of images except for one of said plurality of images;

(d) receiving digital data corresponding to said one of said plurality of images;

(e) multiplexing said digital data corresponding to said each of said plurality of images except for one of said plurality of images, with said digital data corresponding to said one of said plurality of images, in accordance with said selected given one of said selectable, variable, multiple formats to derive multiplexed digital data;

(f) providing said multiplexed digital data to said printer; and

(g) printing said plurality of images in correspondence to said multiplexed digital data provided to said printer, whereby to reproduce said plurality of images in printed form in accordance with said selected given one of said selectable variable, multiple formats.

4,345,277

LINEAR LIGHT SOURCE FIXING DEVICE USED IN A FACSIMILE TRANSMISSION APPARATUS

Masaaki Ishikawa, Hachioji, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 7, 1981, Ser. No. 223,081
Claims priority, application Japan, Jan. 18, 1980, 55/4390[U]
Int. Cl.³ H04N *1/24*
U.S. Cl. 358—293 **8 Claims**

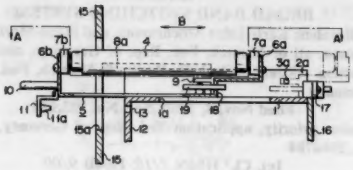
1. A linear light source fixing device of a facsimile transmission apparatus having a chassis, comprising:

a mount capable of moving between first and second positions relatively to said chassis;

at least one pair of sockets attached to said mount at a space from each other and holding a linear light source therebetween;

a first connector terminal member fixed on said chassis and connected with an electric power source;

a second connector terminal member fixed on said mount so as to be electrically connected with said first connector



terminal member when said mount is in said first position and to be electrically isolated from said first connector terminal member when said mount is in said second position; and

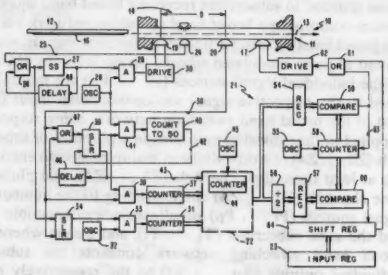
wiring means electrically connecting said second connector terminal member with said sockets.

4,345,278

ACCELERATION CORRECTION FOR SELF-CLOCKING WRITE-HEAD

Glen P. Double, Charlotte, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 8, 1980, Ser. No. 214,318
Int. Cl.³ G11B *25/04, 15/18*
U.S. Cl. 360—2 **8 Claims**



1. In magnetic recording apparatus wherein a magnetic record form and a transducing assembly are moved relatively, one with respect to the other, along a path and wherein the apparatus includes control circuitry responsive to a time base signal and a data signal for controlling the recording of data on said record form, and including magnetic recording means, magnetic reading means aligned with said recording means along said path and spaced downstream therefrom in relation to the direction of said relative movement, and means for measuring the time interval required for a point on the record form to traverse a predetermined distance, the improvement comprising, in combination:

means for delivering a frequency reference signal to said recording means to record a representation thereof on said record form,

frequency measuring means responsive to signals derived by said reading means from said recorded representation of said frequency reference signal for measuring the frequency thereof, and

means responsive to said time interval measuring means and said frequency measuring means for producing a time base signal for said control circuitry defining predetermined

increments of displacement of the magnetic record form with respect to said transducing assembly.

4,345,279

TIME BASE CORRECTION APPARATUS

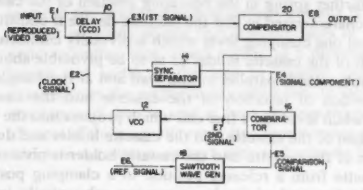
Kenji Kimura, Tachikawa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 1, 1980, Ser. No. 193,255

Claims priority, application Japan, Oct. 16, 1979, 54-143165[U]; Oct. 16, 1979, 54-143166[U]

Int. Cl.³ H04N 5/785

U.S. Cl. 360—36 **9 Claims**



1. A time base correction apparatus for operating on an input signal including jitter and level variation components, comprising:

delay means responsive to said input signal for providing a first signal delayed by a given time in accordance with a frequency of a clock signal, said first signal corresponding to said first signal minus the jitter but including level variation components;

comparator means connected to said delay means for comparing a specific signal component contained in said first signal with a given comparison signal to thereby produce a second signal having a level corresponding to a phase difference between said specific signal component and said given comparison signal;

generator means connected to said delay means and to said comparator means for producing said clock signal as a function of a level of said second signal; and

level variation compensation means including signal combining means connected to said delay means and to said comparator means for providing an output signal obtained by compensating level variation components of said first signal by combining said first and second signals so that said second signal cancels a DC level change of said first signal caused by time-delay operation in said delay means so that said output signal exactly corresponds to said input signal but without said jitter and level variation components.

4,345,280

ADDRESS MARK DETECTION CIRCUIT

John H. Blagaila, Boulder, and James F. Hopper, Louisville, both of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Sep. 4, 1980, Ser. No. 183,936

Int. Cl.³ G11B 5/09

U.S. Cl. 360—49 **10 Claims**

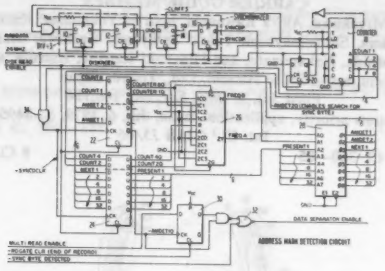
1. An address mark detection circuit for detection of an address mark recorded on a magnetic data storage means, said mark comprising a series of pulses of predetermined length and predetermined frequency comprising:

means for measuring the frequency of pulses recorded on said storage means;

means for measuring the duration of series of pulses measured to be at said predetermined frequency;

means for comparing the measured duration of said series with said predetermined length; and

means for indicating detection of an address mark in response to an indication by said means for comparing that the measured duration of said detected series of pulses of



said predetermined frequency is at least equal to said predetermined length.

4,345,281

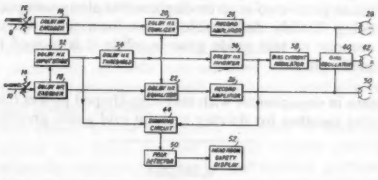
INDICATOR FOR HEADROOM EXTENSION SYSTEM FOR TAPE RECORDERS

Peter Philips, Mineola, N.Y., assignor to Harman-Kardon, Incorporated, Woodbury, N.Y.

Filed Aug. 13, 1980, Ser. No. 177,564

Int. Cl.³ G11B 5/47, 27/36

U.S. Cl. 360—66 **5 Claims**



1. An indicator for use with a tape recorder comprising:

(a) sampling means for sampling the signal to be recorded for presence of high-amplitude, high-frequency signals, said sampling means providing a first control signal directly proportional to the amount of high-amplitude, high-frequency energy present in the signal to be recorded, and a second control signal inversely proportional to the amount of high-frequency, high-amplitude energy present about a predetermined threshold in the signal to be recorded, means for summing said first and second control signals,

(b) means for selectively reducing the bias signal on the magnetic media to thereby increase the amount of recording headroom available on said media,

(c) said bias reducing means being connected to and activated by said control signal, and

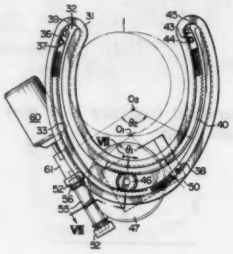
(d) display means connected to and activated when said sum of said first and second control signals is not zero to visually display the activation of said bias reducing means to thereby display the increased recording headroom provided.

4,345,282

APPARATUS FOR BRINGING WIRE-SHAPED OR TAPE-SHAPED CARRIER INTO CONTACT WITH CARRIER GUIDE MEMBER

Seii Miyakawa; Akira Kawauchi, both of Yokohama; Kazunori Iijima, Shimoinayoshi; Takao Terayama, Kashiwa; Masashi Yoshida, Nakaminato, and Hideyuki Kawase, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 7, 1980, Ser. No. 166,754
Claims priority, application Japan, Jul. 6, 1979, 54-84950
Int. Cl.³ G11B *15/66*
U.S. Cl. 360—85 **8 Claims**



1. An apparatus for bringing a tape-shaped carrier member received in a receiving section into contact with a drum-like carrier guide member in a predetermined position comprising:

withdrawing guide means for engaging with said tape-shaped carrier member and for bringing the tape-shaped carrier member from said receiving section to a position in which the tape-shaped member is in contact with said drum-like carrier guide member;

at least one flexible, strip-shaped power transmitting member connected to said withdrawing guide means;

guiding means including at least one guide groove extending along a longitudinally curved path, said power transmitting member being longitudinally, movably fitted in said guide groove so as to be displaceable along said path, and being flexibly deformable to conform with the curved contour of said guide groove while it is moved in said guide groove;

and

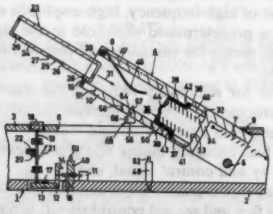
means in engagement with said strip-shaped power transmitting member for driving it along said guide groove.

4,345,283

RECORDING AND/OR REPRODUCING APPARATUS

Gerhard Maryschka, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 23, 1980, Ser. No. 173,210
Claims priority, application Austria, Aug. 7, 1979, 5399/79
Int. Cl.³ G11B *15/66*
U.S. Cl. 360—96.6 **4 Claims**



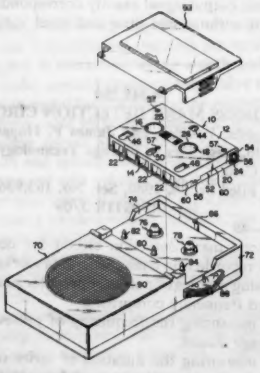
1. A recording and/or reproducing apparatus for use with a record carrier in the form of a tape which is accommodated in a cassette, which cassette is adapted to be inserted into a channel-shaped cassette holder on the apparatus, which holder is movable between a loading position and an operating position and comprises a wall formed with at least one opening for the passage of members provided for locating an inserted cassette which members are arranged on the apparatus, a latching device for the cassette, which cassette is inserted into the cassette holder in the loading position of said holder against the force of at least one spring, and at least one further spring which urges the cassette against said wall of the cassette holder in the loading position of the cassette holder, the inserted cassette being held in an operating position in which it is lifted off said wall of the cassette holder by the locating members and into which it is released by the latching device against the force of said further spring in the operating position of the cassette holder, characterized in that the latching device is constituted by at least one clamping lever which is pivotally connected to said wall of the cassette holder so as to be pivotable about an axis which extends parallel to said wall and at right angles to the direction of insertion of the cassette into the cassette holder, whch lever has a free end which projects into the path of insertion of the cassette into the cassette holder and during insertion of the cassette into the cassette holder is pivoted by the cassette from a released position to a clamping position with said free end of the lever moving substantially in the direction of insertion of said cassette, said free end of the clamping lever, when the lever is in the clamping position, forming a clamping connection with the inserted cassette under the influence of the resultant force of the said at least one spring and said at least one further spring which act on the inserted cassette, which connection when the cassette receptacle is moved to the operating position thereof, is released by lifting the cassette off the clamping lever and returning said lever to its released position, out of which position the clamping lever can be pivoted by the cassette with said free end of the lever moving substantially in the oppoite direction to the direction of insertion of the cassette when the cassette is removed from the cassette holder.

4,345,284

DEVICE FOR PREVENTING ELECTROSTATIC CHARGES ON A MAGNETIC RECORDING TAPE OF A TAPE CASSETTE

Shoichi Saito, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 30, 1980, Ser. No. 145,365
Claims priority, application Japan, May 7, 1979, 54-60452[U]
Int. Cl.³ G11B *23/08*
U.S. Cl. 360—132 **9 Claims**



1. A tape cassette for mounting in a magnetic recording tape running apparatus having means for receiving a tape cassette housing, at least one element having an electroconductivity

and at least one reel shaft for engagement with magnetic recording tape in said housing for causing running of the magnetic recording tape, comprising:

a magnetic recording tape having an electroconductive nature and being accumulated with electrostatic charges, said tape having two opposite elongated faces;

a cassette housing made of an electroconductive material and storing therein said magnetic recording tape, and said housing constantly contacting said at least one electroconductive element of the magnetic recording tape running apparatus when said housing is mounted in the receiving means of the magnetic recording tape running apparatus; and

an electroconductive member made of an electroconductive material and provided in said cassette housing in constant contact with one of said two opposite faces of the magnetic recording tape which extend in a direction of the length and width of the tape to transfer electrostatic charges from the magnetic recording tape to said cassette housing, and then to said at least one electroconductive element of the magnetic recording tape running apparatus which is in constant contact with said cassette housing.

4,345,285

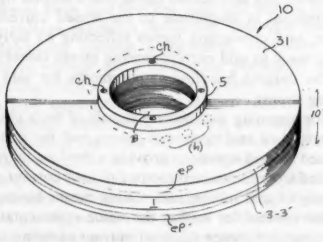
FLOPPY PACK WITH VARIABLY-SPACED ISOLATION MEANS

Dean DeMoss, Camarillo, and Harvey J. Richardson, Sepulveda, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 156,197, Jun. 3, 1980. This application Jul. 25, 1980, Ser. No. 172,234

Int. Cl.³ G11B *23/02, 5/016*

U.S. Cl. 360—133 **39 Claims**



1. In an improved rotatable memory module comprising a stack of like-spaced flexible record disks stacked along a common axis to be co-rotated and adapted to be pneumatically partitioned, plus a pair of stiffener means, one at either end of the stack; and

a pair of like isolation pack means, one between each respective stiffener means and the adjacent end of the record stack, each isolation pack means comprising a stack of spaced flexible isolation disks arranged along said axis in an isolation stack, the combination therewith of:

air supply means comprising conduit means adapted to conduct pressurized separation air to the gap between each adjacent pair of disks, this conduit means being arranged and adapted to also conduct a burst of partition-air to any "selected" one of the gaps between said record disks; this module further being arranged to deliver a relatively larger burst to those of said record gaps that lie at or adjacent the axial ends of said record disk stack.

4,345,286

POWER SUPPLY DEVICE FOR A MULTIFUNCTION APPARATUS HAVING A PLURALITY OF POWER SOURCES

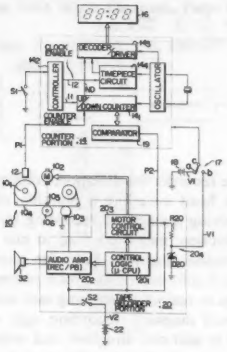
Katsumi Kanayama; Kenzi Furuta, and Kazuyasu Motoyama, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 2, 1980, Ser. No. 136,447

Claims priority, application Japan, Apr. 10, 1979, 54/43291

Int. Cl.³ G11B *23/00*

U.S. Cl. 360—137 **5 Claims**



1. A power supply device for a multifunction tape recorder having a plurality of power sources, comprising:

an electrically operable counter portion;

an electrically operable tape recorder portion comprising a tape drive arrangement, and consuming more power than said counter portion;

a first power source removably installed in said tape recorder and being coupled to said counter portion for normally supplying power to said counter portion, said first power source comprising a first replaceably battery having a given life for operating said counter portion;

contacting means for contacting said first replaceable battery when it is installed in said tape recorder;

a second power source coupled to said tape recorder portion for supplying power to said tape recorder portion, said second power source comprising a second replaceable battery having a limited life shorter than said given life of said first replaceable battery in actual operation of said tape recorder portion; and

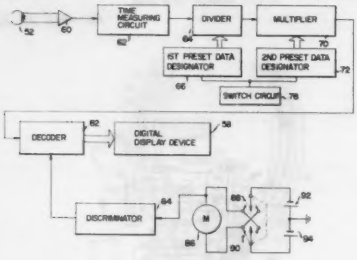
switch means operable in interlocked relation to the installation of said first replaceable battery, said switch means being coupled to said first and second replaceable batteries, to said counter portion and to said tape recorder portion, and being responsive to removal of said first replaceable battery from said tape recorder for automatically switching over power supply from said second replaceable battery to said counter portion when said first replaceable battery is removed from said tape recorder, and being responsive to installation of a first replaceable battery for automatically switching over power supply from said first replaceable battery to said counter portion.

4,345,287

WORD LINE NUMBER COUNT/DISPLAY DEVICE FOR TAPE RECORDER

Minoru Kobayashi, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1980, Ser. No. 161,316
Claims priority, application Japan, Jun. 26, 1979, 54-80334
Int. Cl.³ G11B 5/008
U.S. Cl. 360—137 **8 Claims**



1. In a tape recorder for dictation, comprising a multi-channel magnetic head including a plurality of magnetic heads; means for driving a magnetic recording tape in either one or the other direction; means coupled to one magnetic head of said multi-channel magnetic head for recording a dictation containing such information as a main communication content and a message or remark concerning said main communication content on said magnetic recording tape when said tape is being driven in said one direction; and means coupled to another magnetic head of said multi-channel magnetic head for recording, when said tape is being driven in said one direction, a first cue signal on said tape immediately before the recording of said message or remark, a second cue signal different from said first cue signal on said tape immediately before the recording of said main communication content, and a third cue signal of the same kind as said second cue signal on said tape immediately after the recording of said main communication content;

the improvement comprising a word line number count/display device comprising:

detecting means for detecting said second and third cue signals from said magnetic recording tape while it is being driven in either said one or the other direction and for producing detection signals corresponding to said detected second and third cue signals;

time measuring circuit means electrically connected to said detecting means for receiving said detection signals and for measuring the period of time elapsed from the reception of the detection signal corresponding to either one of said second and third cue signals till the reception of the detection signal corresponding to the other one of said second and third cue signals to produce a time period signal corresponding to the length of the measured time period;

dividing circuit means electrically connected to said time measuring circuit means for dividing said time period signal by a predetermined reference value corresponding to a predetermined period of time to produce a quotient signal corresponding to the quotient of the division;

multiplying circuit means electrically connected to said dividing circuit means for multiplying said quotient signal by a predetermined value obtained by dividing the number of words spoken during the afore-said predetermined period of time by an average number of words contained in one line of a typing paper used by a typist to produce a product signal corresponding to the product of the multiplication;

decoder means electrically connected to said multiplying circuit means for producing a digital signal corresponding to said product signal; and

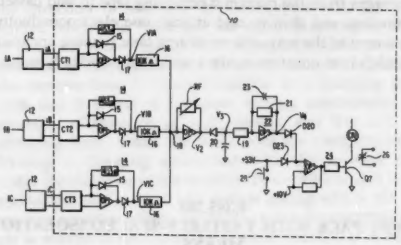
digital display means electrically connected to said decoder for displaying digital information corresponding to said digital signal.

4,345,288

SOLID STATE OVER-CURRENT PROTECTIVE APPARATUS FOR A POWER CIRCUIT

Julian C. Kampf, Grafton; Richard J. Graefe, Bayside, and Mark V. Profio, Wauwatosa, all of Wis., assignors to Square D Company, Palatine, Ill.

Filed May 4, 1981, Ser. No. 260,545
Int. Cl.³ H02H 7/085, 7/09
U.S. Cl. 361—31 **17 Claims**



1. A solid state overload protective apparatus for an electric motor comprising:

means for sensing the current flowing through each phase of said motor when energized and for generating a sensed output signal proportional in magnitude to the sensed current;

means responsive to the sensed output signal of each phase for converting said sensed signal into a second signal also proportional in magnitude to the sensed current of the motor, said converting means reflecting an active short circuit back to said current sensing means thereby reducing the current handling requirements for said current sensing means;

means for summing said second signals of each phase from the output of said converter means and for scaling said summed second signals to provide a third signal representative of a predetermined motor full load current carrying capacity of said motor, said scaling means having an adjustable control for setting the value representative of a predetermined motor full load current carrying capacity;

means for integrating said third signal output of said summing and scaling means to provide a trip signal, said integrating means having a feedback capacitor connected from the output of said integrating means to one of its inputs;

comparator means having one input tied to a predetermined trip reference voltage and another input connected to the output of said integrating means to receive said trip signal, said comparator means producing a drive output signal when said trip signal is a lesser magnitude than said trip reference signal, and said comparator producing a turn off signal indicative of an overload condition when said trip signal exceeds the magnitude of the trip reference signal; and,

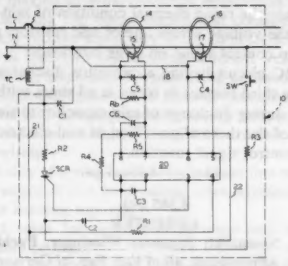
means responsive to said drive and turn off signals for continuing the supply of current to said motor when the drive signal is present and for interrupting the supply of current to said motor when the turn off signal is present, respectively.

4,345,289

GROUND FAULT CIRCUIT INTERRUPTING DEVICE WITH IMPROVED THYRISTOR TRIGGERING

Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed May 4, 1981, Ser. No. 260,512
Int. Cl.³ H02H 3/33
U.S. Cl. 361—45 7 Claims



1. A module for utilization in a ground fault circuit interrupting device including a differential current transformer having a secondary winding in which is developed a fault signal proportional to any imbalance in the currents flowing in the line and neutral conductors of an AC power distribution circuit occasioned by a line-to-ground fault, separable contacts for interrupting at least the line side of the distribution circuit, and a trip solenoid for initiating separation of the contacts, said module comprising, in combination:

A. a power supply connected across the line and neutral conductors of the AC distribution circuit, said power supply including

(1) a first section having a first voltage supply bus,

(2) a second section having a second voltage supply bus,

(3) a first diode conducting half-wave rectified line current from the distribution circuit onto said first bus,

(4) a second diode conducting said half-wave rectified line current from said first bus onto said second bus,

(5) a voltage regulator connected with said first bus for establishing thereon a regulated, half-wave rectified supply voltage for a substantial portion of each conducting half-cycle of said first diode; and

(6) a filter capacitor connected with said second bus for effectively establishing thereon a DC supply voltage;

B. an integrating capacitor having a first terminal connected to said second bus and a second terminal;

C. an amplifier having an input connected to the differential transformer secondary winding for amplifying a fault signal developed therein and an output connected with said second integrating capacitor terminal such as to provide a charging current therefor of a magnitude related to the fault signal magnitude;

D. a thyristor connected in series with the trip solenoid across the line and neutral conductors of the distribution circuit and having a gate;

E. a driver powered from said second bus for drawing pulses of current therefrom for application to said gate pursuant to triggering said thyristor into conduction and thus activating the trip solenoid to initiate contact separation; and

F. a comparator including

(1) a first input connected with said second integrating capacitor terminal,

(2) a second input,

(3) means for developing a reference voltage at said second input,

(4) an output connected with said driver, and

(5) means controlled by said voltage regulator for strobing said comparator near the beginning of each half-cycle of said half-wave rectified supply voltage on said first bus as voltage regulation is achieved to compare the voltage at said second integrating capacitor terminal with said reference voltage,

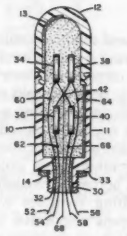
(6) when said voltage at said second integrating capacitor terminal falls into equality with said reference voltage, said comparator output conditions said driver to deliver a triggering current pulse to said thyristor gate, the resulting current drain causing a reduction in said DC supply voltage and a corresponding reduction in said second integrating capacitor terminal voltage such that an additional thyristor gate triggering pulse is delivered by said driver when said comparator is again strobed at the beginning of the next half-cycle of said half-wave rectified supply voltage.

4,345,290

ELECTRICAL TRANSIENT SUPPRESSOR

Richard H. Johnson, 3401 White Diamond, Prior Lake, Minn. 55372

Filed Sep. 22, 1980, Ser. No. 189,607
Int. Cl.³ H02H 3/20
U.S. Cl. 361—56 12 Claims



1. An electrical circuit for limiting high voltage transients in an alternating current voltage supply circuit of the type having a common neutral and an electrical ground comprising:

a. A number of first varistors connected to a common point and to each voltage leg of said voltage supply circuit, said varistors having a breakdown voltage rating of a predetermined value in excess of said voltage supply nominal value;

b. An electrical connection from said common point to said common neutral;

c. A further varistor connected from said common neutral to said electrical ground of said voltage supply circuit, said further varistor having a breakdown voltage rating of a predetermined value substantially in excess of said voltage supply nominal value; and

d. Encapsulating means for protecting said electrical circuit from the environment, said encapsulating means including:

i. a relatively thin insulative coating formed on said number of first varistors and said further varistor and said common point;

ii. a hollow enclosure member having a first opening through a wall of said enclosure, and a generally tubular, cylindrical extension projecting outwardly from said wall and in alignment with said first opening, said first opening having semicircular internal thread means formed therein, said extension also having thread means formed on the external surface thereof and a recess through the interior surface thereof forming a second opening in said hollow enclosure;

iii. a cap member having a cylindrical portion of a diameter dimension to fit within said first opening and having a semicircular external thread means thereon for engaging said thread means in said first opening, said cap having a recess formed in an interior surface thereof; and

iv. an insulative potting compound contained within said enclosure filling said recesses in said enclosure and cap member and surrounding said circuit.

4,345,291

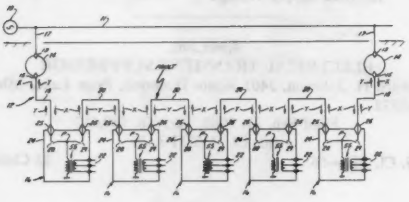
AUTOMATIC SECTIONALIZING SYSTEM

Richard E. Riebs, Hales Corners, Wis., assignor to RTE Corporation, Waukesha, Wis.

Filed Apr. 21, 1980, Ser. No. 142,433

Int. Cl.³ H02H 7/26

U.S. Cl. 361—68 **20 Claims**



1. In an underground shielded cable electric power distribution loop circuit having a pair of recloser switches connected in series in said loop circuit and electrical apparatus connected to said shielded cable between said recloser switches; a high frequency fault indicating isolating system, said system comprising a number of normally closed isolating switches connected in series in said shielded cable, means responsive to a fault current for arming those isolating switches between which a fault occurs, actuating means operatively connected to open only the isolating switches which have been armed, signal generating means responsive to a fault current in said loop circuit to apply high frequency control signals to said cable, said signal generating means responding to the absence at a predetermined time of the high frequency control signal from the faulted section of the cable to operate the actuating means to open the isolating switches which have been armed, after the recloser opens.

4,345,292

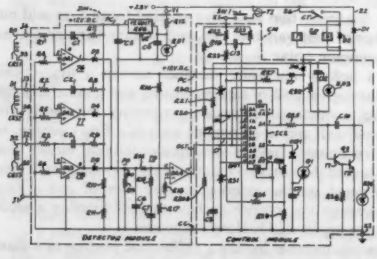
MINIMUM SIZE, INTEGRAL, A.C. OVERLOAD CURRENT SENSING, REMOTE POWER CONTROLLER

James R. Jaeschke, Waukesha, and Walter L. Rutchik, Wauwatosa, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 71,725, Aug. 31, 1979, abandoned, which is a division of Ser. No. 214,616, Dec. 9, 1980, which is a continuation of Ser. No. 923,325, Jul. 15, 1978, abandoned. This application Jun. 4, 1981, Ser. No. 270,463

Int. Cl.³ H02H 3/093

U.S. Cl. 361—94 **7 Claims**



1. In a protective means for an electrical system supplying a load device from an electrical power supply line, the improvement comprising:

thermal simulation means for providing a control signal having a magnitude and duration proportional to the thermal condition of the electrical system for tripping a protective device when the line current reaches an overload value comprising:

means responsive to said line current for providing a charge current,

an RC time delay circuit having a capacitor charge path for said charge current including two series resistors with said control signal being taken from the junction therebetween to simulate the rising thermal condition of said electrical system, the voltage across one of said resistors providing a fast trip control signal on large overloads;

and said RC circuit having a capacitor discharge path including a third resistor in series at all times with said two resistors during discharge of said capacitor to simulate the cooling of the thermal condition of said electrical system at said control signal junction.

4,345,293

ARRESTER

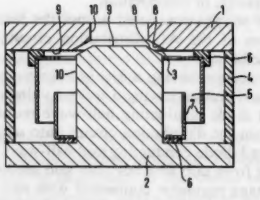
Peter Hasse, Neumarkt; Johannes Wiesinger, Puchheim, and Erich Pivit, Allmersbach, all of Fed. Rep. of Germany, assignors to Dehn + Söhne + Co. KG, Nuremberg and AEG-Telefunken Aktiengesellschaft, Frankfurt and Berlin, both of, Fed. Rep. of Germany

Filed Aug. 20, 1980, Ser. No. 179,704

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1979, 2934237

Int. Cl.³ H01T 1/02

U.S. Cl. 361—117 **7 Claims**



1. In an overvoltage arrester composed of two electrodes spaced apart to define a gas spark gap presenting an arc discharge region, a spacer member of insulating material interposed between the electrodes and forming with the electrodes the walls of a chamber communicating with the arc discharge region, and means associated with the chamber for establishing therein a labyrinth gas flow path between the arc discharge region and the spacer member, the improvement wherein one of said electrodes has the form of a solid cylinder and the other of said electrodes has the form of a disk with an essentially central bore which serves as a discharge opening leading into the open air near said arc discharge region to permit rapid escape of hot gas collecting in the chamber under excess pressure as the result of an arc discharge.

4,345,294

OVERVOLTAGE-ARRESTER DEVICE FOR TERMINAL- OR JUNCTION BLOCKS IN TELECOMMUNICATION EQUIPMENT

Horst Forberg, and Klaus-Peter Achtnig, both of Berlin, Fed. Rep. of Germany, assignors to Krone GmbH, Berlin, Fed. Rep. of Germany

Filed Feb. 23, 1981, Ser. No. 237,382

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1980, 3014796

Int. Cl.³ H02H 1/04

U.S. Cl. 361—119 **8 Claims**

1. A modular exchangeable overvoltage arrester device for

terminal or junction blocks in telecommunication equipment, said device being adapted to accommodate a plurality of different laterally adjacent overvoltage arresters, said device comprising:

a plug-in-type housing of electrically insulating material comprising:

a housing base;

a housing top removably attachable to said housing base;

a plurality of contact blades projecting from said housing for making external electrical interconnections;

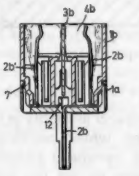
said housing top being shaped and configured to selectively receive a plurality of different switch prongs and earth bars thereby forming different versions of said housing, each such version being adapted to receive a distinct configuration of arrester elements;

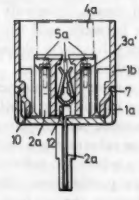
a first of said housing versions being adapted to receive standard commercial 6×8 and 8×8 arrester elements and comprising:

a plurality of spring loaded single blade first switch prongs arranged in two confronting rows adjacent the sides of said housing top; and

a first earth bar positioned between said rows of first switch prongs;

said first switch prongs and said earth bar being configured and adapted to engagingly hold said arresters therebetween in opposite pairs, one on either side of said first earth bar, thereby making appropriate electrical contact with said first switch prongs and said first earth bar;





a second of said housing versions being adapted to receive standard commercial twin arresters, each of said arresters having three pins projecting from the bottom thereof, said second housing comprising:

a plurality of second switch prongs comprised of pairs of juxtaposed spring blades arranged in two confronting rows adjacent the sides of said housing top; 2 a second earth bar positioned between said rows of said second switch prongs; and

a plurality of spring arm pairs mounted to said second earth bar;

each of said second switch prong pairs being adapted to engagingly hold one of the pins of said twin arrester, there being two of said second switch prong pairs for each said twin arrester thereby electrically contacting two of the pins of said twin arrester, each of said spring arm pairs being adapted to engagingly hold the third pin of said twin arrester, thereby making positive electrical ground contact;

each of said first and second switch prongs and each of said earth bars being connected to one of said externally projecting contact blades.

4,345,295

ARRESTER WITH SPARK GAP

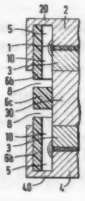
Peter Hasse, Neumarkt; Johannes Wiesinger, Puchheim, and Erich Pivit, Allmersbach, all of Fed. Rep. of Germany, assignors to Dehn & Söhne & Co. KG, Nuremberg and Aeg-Telefunken Aktiengesellschaft, Frankfurt and Berlin, both of, Fed. Rep. of Germany

Filed Aug. 20, 1980, Ser. No. 179,706

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1979, 2934236

Int. Cl.³ H01T *5/00*

U.S. Cl. 361—130 **13 Claims**



1. In an arrester for limiting overvoltages in a low voltage power system and for coupling conductors which are normally resistively separated from one another for lightning protection, which arrester includes at least two electrodes spaced apart to define at least one spark gap forming an arc discharge region, and insulating means holding the electrodes in spaced-apart relation, the improvement wherein there are at least three said electrodes arranged in sequence to define at least series-arranged spark gaps, and said arrester comprises: means defining a first chamber adjacent the arc discharge region and providing a chamber wall of an insulating material which emits a quenching gas under the effect of heat and provided with at least one outlet aperture through which the gases emitted under the effect of the heat generated during arc discharge can escape; and means mounted for isolating said spark gaps from one another with respect to arc discharge.

4,345,296

DEVICE FOR CONTROLLING THE CURRENT THROUGH AN INDUCTIVE CONSUMER, ESPECIALLY A MAGNETIC VALVE IN THE FUEL METERING SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Wolfram Breitling, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 26, 1980, Ser. No. 163,118

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1979, 2932859

Int. Cl.³ H01H *47/32*

U.S. Cl. 361—154 **8 Claims**

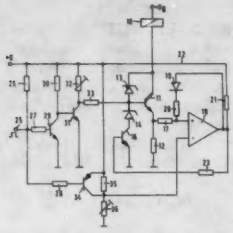
1. Apparatus for controlling the current through an inductive consumer of the type requiring a higher current during an initial attracting phase than during a subsequent maintenance phase of its operation, comprising:

first switching means and current measuring means connected in series with the inductive consumer between operational voltage lines; and

a threshold switch means, coupled with the current measuring means, for determining the transition between the initial attracting phase and the subsequent maintenance phase of the consumer operation;

the first switching means including at least one transistor, a controllable direct voltage source, and second switching means, actuated by the threshold switch means, for connecting the controllable direct voltage source parallel to a

series circuit comprising at least one base-emitter path of the at least one transistor and a measuring resistor consti-



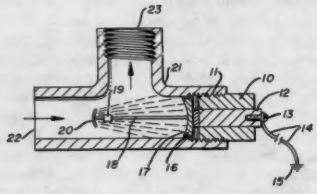
tuting the current measuring means, during the maintenance phase of the consumer operation.

4,345,297

ELECTRONIC STATIC DISCHARGE APPARATUS

Alex J. Check, 827 Fourth St., Santa Monica, Calif. 90403

Filed Mar. 24, 1980, Ser. No. 132,887
Int. Cl.³ H05F 3/06
U.S. Cl. 361—215 **4 Claims**



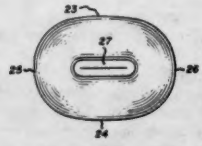
1. Static discharge apparatus for non-conductive fluids comprising a source of radioactivity, a rod mounting said source of radioactivity and a receiving antenna supporting said rod, a ground and means connecting said receiving antenna and rod to said ground, said source of radioactivity being spaced by said rod with respect to said receiving antenna, said means connecting said receiving antenna and rod to said ground comprising a plug having an exterior thread pattern and a ground wire extending from said plug to said ground.

4,345,298

MODIFIED ROUND ROLL CAPACITOR AND METHOD OF MAKING

Frederick W. Grahame, Glens Falls, N.Y., assignor to General Electric Company, Hudson Falls, N.Y.

Filed Sep. 19, 1980, Ser. No. 188,440
Int. Cl.³ H01G 1/017
U.S. Cl. 361—273 **14 Claims**



1. In an electrical capacitor comprising a pair of spaced strip electrodes and a synthetic resin strip dielectric therebetween to form a laminate which is wound in round roll form, flattened and placed in a casing and impregnated with a dielectric fluid, the improvement comprising

(a) the said strip electrodes comprising capacitor tissue paper having both sides metallized with a thin layer of metal;

(b) a central core structure in said roll;

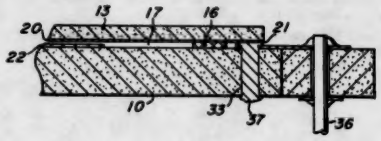
(c) said central core structure being less compressible than said roll and being a thick walled tube on which said roll was wound and flattened therewith, to provide a solid spacer in said roll essentially without any intervening space in the center of said roll.

4,345,299

CAPACITIVE PRESSURE TRANSDUCER ASSEMBLY WITH IMPROVED OUTPUT LEAD DESIGN

Roland K. Ho, McHenry, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 3, 1980, Ser. No. 202,988
Int. Cl.³ H01G 7/00
U.S. Cl. 361—283 **19 Claims**



1. A pressure transducer assembly in which pressure changes displace a diaphragm whose position determines electrical characteristics of the transducer assembly, comprising:

base substrate means having top and bottom substantially planar end surfaces, and having a peripheral portion with a lead bonding area thereon;

flexible diaphragm means, relatively thin with respect to a thicker distance between said top and bottom base substrate end surfaces, having a planar central portion and a surrounding peripheral portion;

mounting means for mounting said peripheral portion of said diaphragm means to said base substrate means top surface, said mounting means, said diaphragm planar central portion and said base substrate top surface generally forming an internal cavity wherein a reference pressure exists, said diaphragm central portion being displaceable with respect to said base substrate top surface in response to sensed pressure changes to thereby alter electrical characteristics of said transducer assembly,

said base substrate means peripheral portion and lead bonding area extending laterally with respect to and beyond the perimeter of said diaphragm means and having, in said lead bonding area, at least one lead through hole from said top to bottom base substrate surfaces for receiving an electrical lead;

said transducer assembly including at least a planar electrode metallization mounted on said diaphragm central portion and having a radial outward projection;

metallization deposited adjacent said lead through hole on of said base substrate means;

an electrical output lead positioned in said through hole and extending to at least said top and bottom base substrate surfaces; and

connection means for electrically connecting said diaphragm electrode to said lead and connecting said lead to said base substrate metallization adjacent said lead through hole,

wherein said adjacent through hole metallization is positioned on said base substrate top surface, and wherein a planar projection of said adjacent through hole metallization extends generally inwardly and overlaps, but is spaced apart from, said diaphragm electrode radial outward projection, and wherein said connecting means

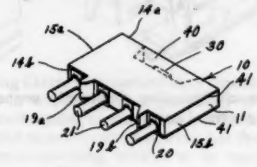
comprises means for electrically connecting said adjacent base substrate through hole metallization inward projection and said diaphragm means electrode outward projection in said area of overlap.

4,345,300

RECESSED CIRCUIT MODULE

Ronald L. Stuckey, Monroe, Ind., assignor to CTS Corporation, Elkhart, Ind.

PCT No. PCT/US79/01142, § 371 Date Apr. 7, 1980, § 102(e) Date Apr. 7, 1980, PCT Pub. No. WO81/01784, PCT Pub. Date Jun. 25, 1981
PCT Filed Dec. 18, 1979, Ser. No. 153,843
Int. Cl.[3] H05K 1/16
U.S. Cl. 361—386 5 Claims



1. A circuit module of the type having a ceramic substrate characterized by superior heat dissipative properties and wherein said substrate includes first and second spaced-apart side surfaces and includes a plurality of edge surfaces interconnecting the side surfaces, having a plurality of connector pins that are disposed substantially parallel to the side surfaces and that extend outwardly from the substrate, and sized to permit a plurality of equally sized circuit modules to be positioned side-by-side with a cumulative stack-up dimension corresponding substantially to the cumulative widths of the positioned modules, the improvement comprising: a component-receiving recess in at least one of the edge surfaces including a recess surface and which does not comprise the width of the substrate, first and second spaced-apart conductive films deposited onto the recess surface, conductive films comprising an electrical circuit deposited on at least one of the first and second side surfaces and overlapping a corner between the side surface and the recess surface to operatively connect the conductive films to said first and second spaced-apart conductive films respectively, said conductive films deposited on said side surfaces operatively connected to selected ones of the connector pins, an electrical device both mechanically and electrically connected directly to the spaced-apart conductor films deposited on the recess surface, and said electrical device proportioned to be disposed wholly between the first and second spaced-apart side surfaces and within said recess, and a plastic filler substantially filling the entirety of said recess and encapsulating the electrical device without contributing any dimensional increase to the stack-up tolerances of side-by-side contiguous circuit modules.

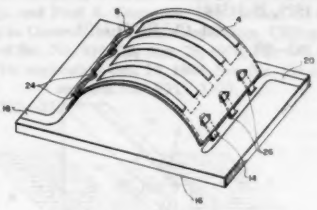
4,345,301

CAPACITIVE HUMIDITY TRANSDUCER

Marvin D. Nelson, St. Louis Park, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 23, 1981, Ser. No. 237,007
Int. Cl.[3] H05K 1/18; H01G 7/00
U.S. Cl. 361—400 4 Claims

1. A capacitive humidity transducer comprising
an electrically non-conductive base member of a hygroscopic material,
a first electrically conductive coating on said base member arranged as a plurality of side-by-side extensions joined at one end to a common electrically conductive strip,
a second electrically conductive coating on said base member arranged as a plurality of side-by-side extensions joined at one end to a common electrically conductive strip and located on the opposite side of said base member from said first coating with said extensions of said first and second coatings being arranged in a facing relationship, said base member and said extensions forming a capacitor affected by atmospheric humidity as a result of the hygroscopic activity of said base member,
a first electrical connector for said first coating,



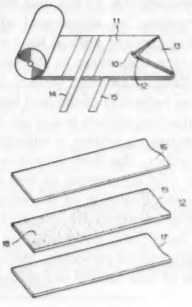
a second electrical connector for said second coating and
a printed circuit board having a first circuit thereon receiving said first connector and a second circuit thereon receiving said second connector, said first and second circuits being spaced closer together than the spacing of said first and second connectors.

4,345,302

LOW NOISE ELECTROLYTIC CAPACITORS

Hideo Kurose, Zushi, Japan, assignor to Momoyo Kuwada, Tokyo, Japan

Continuation of Ser. No. 1,283, Jan. 4, 1979. This application Dec. 4, 1980, Ser. No. 213,045
Claims priority, application Japan, Dec. 16, 1978, 53/156194
Int. Cl.[3] H01G 9/00; B01J 17/00
U.S. Cl. 361—433 6 Claims



1. A low noise electrolytic capacitor comprising:
a pair of electrodes consisting of an anode foil and a cathode foil; and
an intermediate electroconductive layer interposed between said pair of electrodes;
said intermediate electroconductive layer composed of a first paper sheet contacted with said anode foil and impregnated with an electrolyte and a second paper sheet contacted with said cathode foil and impregnated with the electrolyte;
said second paper further containing an electroconductive fine powder distributed therein in an amount of less than 10% by weight based on the weight of said intermediate electroconductive layer; and
said fine powder being about one micron in grain size.

4,345,303

OPTICAL SYSTEMS PERMITTING CONTROLLED SHIFTING OF THE BEAM PATTERN IN HEADLAMPS, ESPECIALLY FOR VEHICLES

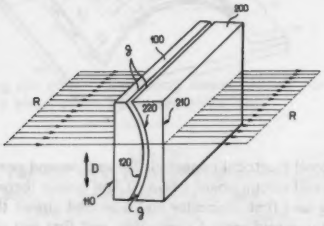
Roland Gerard, Saint-Maurice; Norbert Brun, Bobigny, and Jacques Ricard, Paris, all of France, assignors to Cibie Projecteurs, Bobigny, France

Filed Sep. 29, 1980, Ser. No. 191,499

Claims priority, application France, Oct. 2, 1979, 79 24508; Dec. 24, 1979, 79 31584

Int. Cl.³ B60Q *1/00*

U.S. Cl. 362—80 **13 Claims**



1. In a headlamp for an automobile vehicle, which headlamp is adjustable to vary the direction of the beam produced thereby, and comprises a reflector, and at least one light source fixedly mounted within said reflector, whereby light rays emitted by said light source are reflected by said reflector to form a beam of light, the improvement comprising: providing mountings for fixing said reflector rigidly on a vehicle; providing an optical beam adjusting system comprising at least one generally plate-like transparent optical deflecting element, and means supporting said optical deflecting element in a position to intercept substantially the whole of the said beam formed by said reflector, with said optical deflecting element extending generally perpendicularly to the said beam, and said supporting means permitting an adjustment of the position of said optical deflecting element with at least a component of movement in a direction transverse to the said beam; providing on said optical deflecting element surface configurations of such shapes that those light rays of the said beam which are incident on said beam adjusting system in a given direction emerge from the said beam adjusting system in substantially the same direction as one another, the said direction of emergence being changed by the said adjustment of said optical deflecting element, whereby the direction of the headlamp beam is varied without otherwise substantially affecting the characteristics of the headlamp beam; and providing an actuator mechanism connected to said optical deflecting element, for producing the said adjustment of said optical deflecting element.

4,345,304

RECHARGEABLE LAMP ASSEMBLY, MOUNTING UNIT, AND CIRCUIT THEREFOR

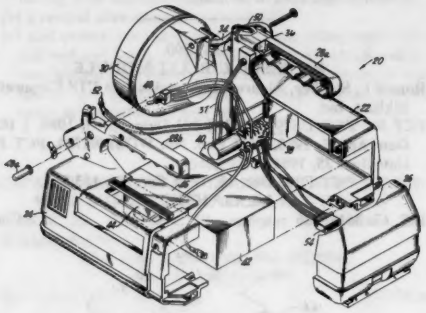
C. Bradford Penney, Norristown, Pa.; Glenn M. Zabec, Franklin Park, and Sri P. Sridharan, Hickory Hills, both of Ill., assignors to Streamlight, Inc., Norristown, Pa.

Filed Mar. 3, 1980, Ser. No. 126,967

Int. Cl.³ F21L *7/00*

U.S. Cl. 362—183 **8 Claims**

1. A rechargeable lamp assembly comprising a lamp unit having a first set of electrical contacts of particular configuration connected to circuit elements within said lamp unit and adapted for releasable connection to a mating second set of electrical contacts, and a mounting unit adapted for releasable mounting of said lamp unit thereto and including said second set of electrical contacts as a part thereof in position to releasably mate with said first set of electrical contacts when said lamp unit is mounted to said mounting unit, said mounting unit including as a part thereof a third set of electrical contacts of



said particular configuration electrically connected to said second set of electrical contacts.

4,345,305

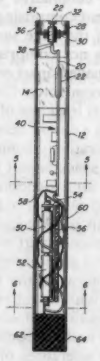
PORTABLE ELECTRONIC SAFETY FLARE SYSTEM

Henry H. Kolm, Wayland, and Eric A. Kolm, Brookline, both of Mass., assignors to Flik, Inc., Cambridge, Mass.

Filed Aug. 11, 1980, Ser. No. 177,129

Int. Cl.³ F21L *7/00*

U.S. Cl. 362—186 **11 Claims**



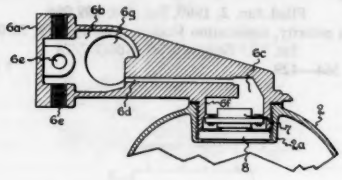
1. A portable electronic safety flare system comprising:
an elongate hollow tube at least a portion of which is transparent;
electronic strobe light circuit means in said tube;
a strobe light mounted in a transparent portion of said tube and driven by said strobe light circuit means;
a power supply disposed in said tube and interconnected with said strobe light circuit means;
a push switch interconnected with said strobe light circuit means for actuating said strobe light;
mounting means for supporting said push switch at a first end of said tube;
first cap means for closing said first end of said tube; said first cap means having a flexible portion for permitting pressure to be applied through it to actuate said push switch; and
second cap means for closing the second end of said tube.

4,345,306

LUMINAIRE MOUNTING DEVICE

Samuel T. Summey, East Flat Rock, N.C., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 10, 1980, Ser. No. 158,169
Int. Cl.³ F21V 29/00
U.S. Cl. 362—294 10 Claims



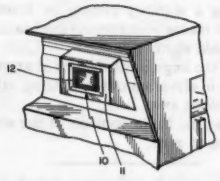
1. A lighting fixture of hazardous duty type for installation in atmospheres in which explosive gases may be evolved comprising, in combination, an elongated bracket having a mounting portion and means for securing a conduit thereto at one end and a luminaire-attaching portion at its opposite end, said bracket having a hollow interior for passage of electrical conductors therethrough from said one end to said opposite end, said hollow interior formed of enlarged chambers at said ends and an elongated narrow wireway opening at opposite ends into said enlarged chambers, a luminaire removably attached to said opposite end of said bracket, and means for electrically connecting said luminaire to the electrical conductors upon attachment of said luminaire to said bracket, whereby any explosive gases entering said bracket at said one end from a conduit secured thereto are cooled and reduced in pressure before reaching said opposite end of said bracket by passage through said narrow wireway.

4,345,307

RECTANGULAR HEADLAMP RETAINER

William R. Mayer, 112 Oak, Rochester, Ill. 62563, and Alton E. Runion, Rte. 10, Rochester, Ill.

Continuation-in-part of Ser. No. 935,490, Aug. 21, 1978. This application May 12, 1980, Ser. No. 148,698
Int. Cl.³ F21V 7/00
U.S. Cl. 362—306 30 Claims



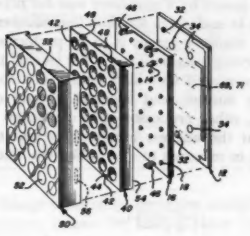
1. A shock mounting retainer assembly for a rectangular lamp, comprising: a generally rectangular supporting base adapted to be fixed to a vehicle, a generally rectangular lamp support mounted adjacent the supporting base and adapted to hold the rectangular lamp, a substantially straight horizontal vibration absorbing hinge constructed of a resilient material interconnecting the supporting base and the lamp support to provide a shock mount between the lamp and the associated vehicle, at least one of said supporting base and said lamp support being constructed of an elastomeric material, said vibration absorbing hinge being integral with at least one of said supporting base and said lamp support, said hinge being located only on one of the adjacent sides of the supporting base and said lamp support so that the lamp support is free to pivot with respect to the supporting base, and a horizontal adjustment mechanism interconnecting the supporting base and said lamp support on the sides thereof opposite the hinge so that upon adjustment of the mechanism the lamp support will pivot about the hinge with respect to the supporting base.

4,345,308

ALPHA-NUMERIC DISPLAY ARRAY AND METHOD OF MANUFACTURE

Arthur A. Mouyard, Glendale Heights; Michael V. Hamby, Chicago, and Paul A. Tomaszek, Des Plaines, all of Ill., assignors to General Instrument Corporation, Clifton, N.J.

Division of Ser. No. 936,728, Aug. 25, 1978, Pat. No. 4,254,453. This application Oct. 14, 1980, Ser. No. 196,452
Int. Cl.³ F21V 5/00
U.S. Cl. 362—332 5 Claims



1. A generally planar lens for a display device comprising a plurality of spherical portion means arranged in a predetermined pattern and protruding from the front viewed surface of the lens for receiving a generally collimated illumination beam of light rays, for dispersing said generally collimated illumination beam over a predetermined volume defined by a viewing angle about a central axis through said lens, for distributing said illumination beam in a substantially uniform manner over a first predetermined portion of said predetermined volume, and for providing a predetermined degree of on-axis concentration of light output along said central axis, said predetermined pattern of integrally formed spherical portion means comprising a first pattern portion defined by a circular area of predetermined diameter centered about said central axis and a second pattern portion defined by the lens surface outside of said circular area, each of said first and second pattern portions including a predetermined spacing of said spherical portion means and a predetermined ratio of the radius of curvature and the height of each of said spherical portion means determined in accordance with said predetermined viewing angle and the distribution of said illumination beam, said ratio being calculated by maximizing the percentage of said illumination beam being transmitted out said lens and by maximizing the dispersion of said transmitted light.

4,345,309

RELATING TO CACHED MULTIPROCESSOR SYSTEM WITH PIPELINE TIMING

Jega A. Arulpragasam, Stow, Mass.; Robert A. Giggi, Merrimac, N.H.; Richard F. Lary, Colorado Springs, Colo., and Daniel T. Sullivan, Bolton, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jan. 28, 1980, Ser. No. 116,083
Int. Cl.³ G06F 9/30, 15/16
U.S. Cl. 364—200 1 Claim

1. A multiprocessor system comprising:

A. main memory means (18) including a plurality of addressable storage locations for storing data;

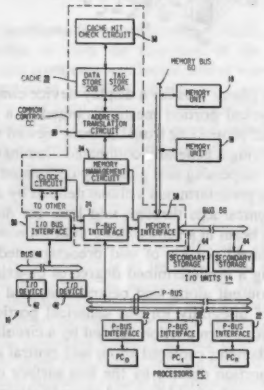
B. a plurality of processor units (22) for processing data in response to instructions and for generating signals including address, data, and writing control signals for initiating

reading and writing transactions that access addressable storage locations in said main memory means;

C. common control means shared by said processor units and said main memory means, said common control means including

i. write-through cache memory means (20) accessible by each of said processor units and including a plurality of addressable storage locations for storing copies of data stored in locations of said main memory means, said cache memory means further including means responsive to said writing control signals for forgoing the writing of associated data signals into cache memory means;

ii. processor indexed means including index locations associated with each processor unit, said processor indexed means being responsive to a writing control signal issued by a processor unit for producing an indication in said index location that another access to said cache memory means is to be performed to complete the writing transaction and for storing the address signals associated with said writing control signal so that during interim read accesses to said cache memory means, other processor units can forgo the reading of data at the address locations in said cache memory means in response to said indication, and



iii. write-back control means for writing data into said cache memory means after the data associated with said writing control signal has been written into said main memory means and for altering the indication in the corresponding index location of said processor indexed means thereby to indicate that the writing operation is completed so that the associated address location in said cache memory means can again be accessed by said other processor units;

D. processor bus means (60) interconnecting said processor units and said common control means for transferring address, control and data signals associated with the transactions among said processor units and said common control means;

E. memory bus means (60) interconnecting said common control means and said main memory means for transferring address, control and data signals associated with transactions between said common control means and said main memory means; and

F. timing means for controlling the operation of said processor bus means and said common control means, said timing means defining a predetermined, repeatable pipeline sequence of fixed time intervals during which said processor bus means and said cache memory means are available to said processor units for the transfer of data therebetween, the time interval during which said cache memory means is available having a duration sufficient to permit only one access to said cache memory means for each transaction initiated by one of said processor units.

4,345,310

AIRCRAFT FLIGHT CONTROL PROCESS AND DEVICE

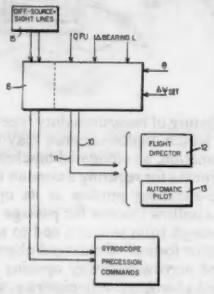
Bernard Gautier, Meudon, France, assignor to Societe Francaise d'Equipements pour la Navigation Aerienne, Villacoublay, France

Filed Jan. 2, 1980, Ser. No. 109,096

Claims priority, application France, Jan. 9, 1979, 79 00441

Int. Cl.³ G06F *15/50;* G06G *7/78*

U.S. Cl. 364—429 **7 Claims**



1. A flight control process, especially for aircraft approach and landing along a glide slope axis similar to the glide slope axis used in the ILS process and forming a predetermined slope with respect to the horizontal, said process comprising the steps of:

(a) determining from on board the aircraft said glide slope axis going through a point on the ground marked by an infrared radiation point source corresponding to the desired point of impact of the aircraft's wheels on the ground during the desired landing of the aircraft, said axis forming a predetermined slope with respect to the horizontal of approximately 3°, said axis being oriented according to a predetermined approach magnetic heading that can depend on the topography of the desired landing site;

(b) recording the aircraft position with respect to said infrared radiation source by sighting said source along a sighting line using a sighting system on board the aircraft equipped with means to determine the bearing and angular elevation of said sighting line;

(c) determining the angular deviations in azimuth and angular deviations in elevation of the sighting axis with respect to said glide slope axis;

(d) and operating the flight controls of the aircraft to bring said deviations to zero.

4,345,311

ELECTRONIC KILOWATT-HOUR METER FOR MEASURING ELECTRICAL ENERGY CONSUMPTION

John S. Fielden, Devon, England, assignor to South Eastern Electricity Board, Hove, England

Filed Jan. 7, 1980, Ser. No. 110,027

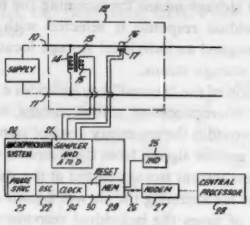
Claims priority, application United Kingdom, Jan. 11, 1979, 7901133

Int. Cl.³ G01R *21/06;* G06F *15/20*

U.S. Cl. 364—483 **7 Claims**

1. A kilowatt-hour meter for determining, from voltage and current signals, the total energy passing through an alternating electrical supply circuit, said meter comprising a clock signal generator including a timing signal frequency generator for generating timing signals at a frequency which is a multiple of the alternating supply frequency and phase locking means for synchronising the phase of the timing signals with the phase of

the alternating supply frequency, pulse sampling means controlled by the timing signals generated by said clock signal generator for sampling the magnitudes of the voltage on and current in the alternating electrical supply circuit at a prese-



lected time in each cycle, and digital data processing means for processing the sampled data to determine energy consumption during successive predetermined periods of time and to integrate the successive determinations of energy consumption.

4,345,312

METHOD AND DEVICE FOR INSPECTING THE DEFECT OF A PATTERN REPRESENTED ON AN ARTICLE

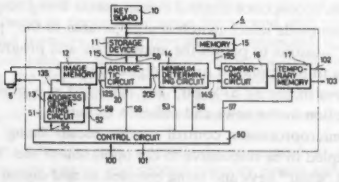
Toshikazu Yasuye; Seiji Kashioka, both of Hachiouji, and Yoshihiro Shima, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 10, 1980, Ser. No. 138,990

Claims priority, application Japan, Apr. 13, 1979, 54-48141[U]; Aug. 15, 1979, 54-103141

Int. Cl.³ G06K *9/36*; G06F *15/20*

U.S. Cl. 364—515 **15 Claims**



7. A pattern defect inspecting device for inspecting for defects in a pattern represented on an article comprising: first means for picking up and storing an image from an article having a pattern to be inspected; second means for extracting from said image a plurality of partial patterns at respective positions on the image which are offset by successively-increasing amounts from a reference position thereon; third means for comparing each of said partial patterns extracted by said second means with a standard pattern to determine a parameter indicating the the extent of lack of correspondence between the standard pattern and each of the respective partial patterns; fourth means for selecting the parameter indicating the minimum extent of lack of correspondence from among the parameters determined by said third means; and fifth means for comparing the parameter selected by said fourth means with a preset threshold value to determine the quality of said pattern to be inspected.

4,345,313

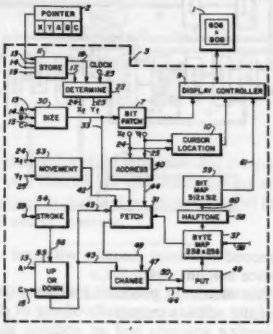
IMAGE PROCESSING METHOD AND APPARATUS HAVING A DIGITAL AIRBRUSH FOR TOUCH UP

Keith T. Knox, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 28, 1980, Ser. No. 144,507

Int. Cl.³ G06F *3/153, 15/20*

U.S. Cl. 364—515 **12 Claims**



1. Electrical image processing apparatus comprising

byte map memory means for storing raster image signals representative of continuous tone images wherein each signal has a value related to the tone level of a pixel within the continuous tone image,

display means coupled to the memory means for creating a visual image in response to the raster image signals applied to it,

cursor means coupled to the display means for applying cursor image signals thereto for creation of an airbrush tip image over a limited region of a visual image and for locating the airbrush tip image relative to the visual image in response to position signals and

airbrush means coupled to the memory and cursor means including pointer means for generating position signals for controlling the location of the airbrush tip image relative to the visual image and control means for gradually modifying in given increments the tone level of raster image signals responsible for creation of the visual image at the region of the airbrush tip image in response to manipulation of the pointer by a viewer at least including movement of the pointer.

4,345,314

DYNAMIC THRESHOLD DEVICE

Robert C. Melamud, Tokyo, Japan; James D. Nihart, Harrisburg, and James M. White, Charlotte, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 19, 1980, Ser. No. 208,221

Int. Cl.³ H04N *1/40*; G06F *15/20*

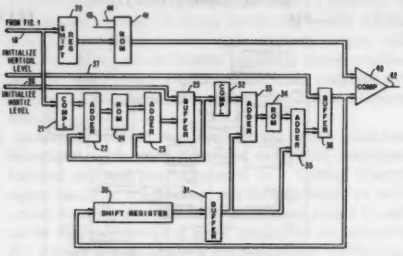
U.S. Cl. 364—515 **6 Claims**

1. A thresholder for input signals, representing the optical density of elements of a two-dimensional density varying image, wherein transducer means produces series of such input signals, each series corresponding to density variations along a first dimension of the image, and wherein the improvement comprises

information storage means for storing a first reference amount and a plurality of second reference amounts,

first means for combining an amount representing one of said input signals with said first reference amount in accordance with a function of the difference therebetween to produce an updated first reference amount and for operatively replacing in said storage means said first reference amount with said updated first reference amount,

second means for combining said updated first reference amount with a selected one of said second reference amounts to produce an updated second reference amount as a function of the difference therebetween and for operatively replacing in said storage means said selected one of



said second reference amounts with said updated second reference amount, and

comparison means for producing a binary output as a function of the relative magnitude of one of said input signal representing amounts and an updated second reference amount.

4,345,315

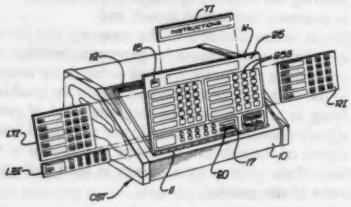
CUSTOMER SATISFACTION TERMINAL

Ernest R. Cadotte, Knoxville, Tenn., and Gerald P. Hester, Santa Ana, Calif., assignors to MSI Data Corporation, Costa Mesa, Calif., by said Gerald P. Hester

Filed Jan. 19, 1979, Ser. No. 4,901

Int. Cl.[3] **G06F** *15/02, 15/20;* **G09B** *7/00*

U.S. Cl. 364—900 **30 Claims**



21. A data collection terminal comprising

a housing having a plurality of keys arranged in rows and columns on one face thereof, said housing simultaneously displaying a plurality of inquiries with multiple responses for each inquiry, a response of the group of multiple responses for an individual inquiry being arranged in association with an individual key whereby the operation of a key represents the selection by the terminal user of the associated response,

the keys being arranged in an electrical matrix of rows and columns with each key arranged in electrical open circuit relationship with an individual row and column and the operation of the key momentarily bridges the row and column lines of an operated key to provide an answer signal,

the keys including a "record key" arranged at a preselected location in the rows and columns of keys to provide a "record" signal to said terminal,

microprocessor control circuit means mounted in the housing for providing key scan signals to the electrical matrix of rows and columns, row-by-row, for detecting and signalling the operation of an individual key and providing an answer signal to said microprocessor circuit means representative of the operated key, said microprocessor control circuit means including temporary storage means for temporarily storing the answer signals at preselected storage locations in accordance with the positions of the keys in said rows and columns,

permanent storage means for summing the number of times an individual response is selected with each response being assigned an individual storage location in said permanent storage means,

the operation of the "record" key provides a "record" signal to said microprocessor circuit means and said circuit means provides the necessary control signals for transferring the answer signals from the temporary storage means to said permanent storage means at the individual storage locations for summing the answer signals and thereby the number of times the individual responses have been selected by the terminal users, the plurality of keys including a plurality of keys representative of numerical data, each key being representative of a different piece of numerical data, and

wherein said housing includes digital display means for displaying alpha-numeric data and a mode select switch operable between an "operate" mode and a "parameter" mode, the mode select switch being mounted and secured in said terminal to be accessible only to an authorized individual, the "operate" mode of the select switch permitting anonymous individuals to operate the keys of the terminal to select the individual responses and thereby cause the microprocessor control circuit means to acquire the individual responses and display the selected responses as selected and to cause the recording of the selected responses in the permanent storage means only upon operation of the "record" key,

the permanent storage means having preselected parameters stored therein in the form of individual segments of numerical data for programming the terminal for performing preselected operations,

the "parameters" mode of the select switch permitting only authorized individuals to view the data comprising the answer data and programming data stored in the permanent memory by means of the digital display means,

said microprocessor control circuit means being responsive to the mode select switch being operated to the "parameter" position to permit the answer data and programming data to be displayed on the digital display

the keys including a "clear" key arranged at a preselected location in the rows and columns of keys,

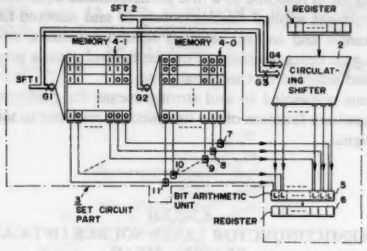
said microprocessor control circuit means being further coupled to be responsive to the operation of the "record" and "clear" keys and being coupled to said digital display means for displaying the numerical data stored in the permanent storage means on the digital display means, the microprocessor control circuit means being further constructed and defined to be responsive to the operation of the "record" key to display the identification of a numerical value representative of a parameter and then responsive to the next sequential operation of the record key to display the identified numerical value so that the parameter and numerical value are displayed in the same sequence as their storage locations in the permanent storage means and to be responsive to the operation of the "clear" key to display the same numerical value and then responsive to the sequential operation of the "clear" key to display the same associate parameter identification data so that they are displayed in reverse sequence from their storage locations in the permanent storage means.

4,345,316

SHIFT ARITHMETIC DEVICE

Tatsushi Hirotani, Kawasaki, and Satoshi Nagata, Kodaira, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 27, 1979, Ser. No. 52,948
Claims priority, application Japan, Jun. 29, 1978, 53-79158
Int. Cl.[3] G06F 7/00; G11C 19/00
U.S. Cl. 364—900 6 Claims



4. A shift arithmetic device, having first and third input gates for applying a first shift signal and having second and fourth input gates for applying a second shift signal, comprising:

a first register for storing N-bit information to be subjected to shift arithmetic processing, where N is an integer;

circulating shifter means, operatively connected to said first register and to the third and fourth input gates, for shifting the contents of said first register in dependence upon the first and second shift signals, said circulating shifter means comprising:

a first shift gate, operatively connected to the third and fourth input gates, for executing a shift of one bit position in dependence upon the first and second shift signals;

a second shift gate, operatively connected to the third and fourth input gates and to said first shift gate, for executing a shift of two, four or six bit positions in dependence upon the first and second shift signals; and

a third shift gate, operatively connected to the third and fourth input gates and to said second shift gate, for executing a shift of eight, sixteen or twenty-four bit positions in dependence upon the first and second shift signals;

first memory means, operatively connected to the second input gate, for storing N-set patterns, for receiving the second shift signal, and for reading out one of said N-set patterns in dependence upon the second shift signal;

second memory means, operatively connected to the first input gate, for storing N-inverted set patterns, for receiving the first shift signal, and for reading out one of said N-inverted set patterns in dependence upon the first shift signal, where said N-inverted set patterns are the inverse of said N-set patterns;

a bit arithmetic unit, operatively connected to said first memory means, said second memory means and said circulating shifter means, for logically processing the output of said circulating shifter means, and said one of said N-set and said one of said N-inverted set patterns respectively read from said first and second memory means; and

a second register, operatively connected to said bit arithmetic unit, for storing the results of said logical processing.

4,345,317

MAGNETIC DOMAIN MEMORY WITH HALL EFFECT DETECTOR

Andrew H. Bobeck, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 25, 1980, Ser. No. 172,374
Int. Cl.[3] G11C 19/08
U.S. Cl. 365—9 11 Claims

1. An arrangement comprising a layer of material in which magnetic domains can be moved, means for moving domains along a path in said layer to an output position, a detector made of a magnetic material responsive to a change in magnetic flux positioned at said output position, said detector having at least first and second terminals, means for providing an electric

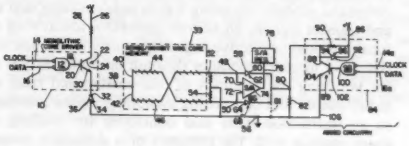
current to said first and second terminals, and means for detecting the effect of a domain on said current, said arrangement being characterized in that said magnetic material including an apeture at said output position.

4,345,318

HIGH PERFORMANCE MONOLITHIC DIGIT DRIVER

Morris O. Stein, Wayne, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Aug. 29, 1980, Ser. No. 182,385
Int. Cl.[3] G11C 7/00
U.S. Cl. 365—196 7 Claims



1. In an inhibit current driving circuit for a core memory including two half windings for inhibiting each digit of a memory word, the windings connected to inputs of a sense amplifier, and diodes connected between respective amplifier inputs and a node, the improvement comprising:

resistance means connected between the node and ground; and

switching means having its output connected across the resistance means for controllably introducing the resistance means in circuit between the node and ground, only at the end of an inhibit cycle thus decreasing the time constant of the circuit and providing fast transient inhibit signal turn off therein.

4,345,319

SELF-CORRECTING, SOLID-STATE-MASS-MEMORY ORGANIZED BY BITS AND WITH RECONFIGURATION CAPABILITY FOR A STORED PROGRAM CONTROL SYSTEM

Vincenzo Bernardini; Enzo Garetti, and Renato Manfreddi, all of Turin, Italy, assignors to CSELT-Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

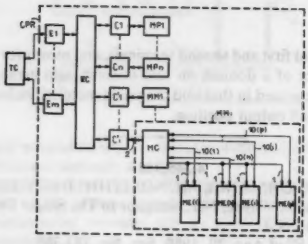
Filed Jun. 22, 1979, Ser. No. 51,246
Claims priority, application Italy, Jun. 28, 1978, 68516 A/78
Int. Cl.[3] G11C 11/40
U.S. Cl. 365—210 5 Claims

1. In a telecommunication system wherein a processor exchanges data through a controller with a mass memory, the improvement wherein said mass memory comprises:

a plurality of solid-state memory modules including a first group of memory modules for the storage of a multiplicity of information words, a second group of memory modules for the storage of as many redundancy words respectively

associated with said information words, and at least one spare module, the number of modules of said first group equaling the number of bits in each information word, the number of modules of said second group equaling the number of bits in each redundancy word, each of said memory modules including a multiplicity of integrated charge-transfer circuits for the continuous recirculation of respective bits, each of said charge-transfer circuits consisting of several randomly accessible blocks of series-parallel-series registers responsive to shift and transfer signals; and

a command module responsive to signals from said controller for writing and reading respective bits of an information word and of an associated redundancy word at corresponding locations of selected charge-transfer circuits of all memory modules of said first and second groups, said command module including a time base emitting said shift and transfer signals, an address generator identifying said locations, and corrective logical circuitry communicating with said memory modules through an input/output unit for verifying the accuracy of bits written and read, said input/output unit comprising switching means responsive to an instruction from said controller for loading said spare module with the contents of a defective memory module of either of said groups and substituting the spare module so loaded for the defective module in subsequent reading and writing operations.

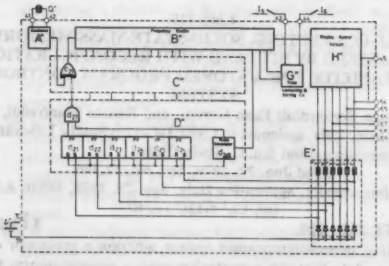


4,345,320

INTEGRATED CIRCUIT FOR A TIME-PIECE

Jean-Claude Berney, Epalinges, Switzerland, assignor to Jean-Claude Berney SA, Epalinges, Switzerland

Continuation of Ser. No. 881,150, Feb. 24, 1978, abandoned.
This application Mar. 31, 1980, Ser. No. 135,742
Claims priority, application Switzerland, Feb. 28, 1977, 2461/77
Int. Cl.³ G04C *19/00, 9/00*
U.S. Cl. 368—87 **3 Claims**



1. An integrated circuit for a timepiece having means responsive to control signals for displaying time data, a power source, and manually actuated time setting elements for producing time setting signals, the integrated circuit comprising:

a first group of terminals including first terminals connecting the displaying means with the integrated circuit, and second terminals connecting the power source and the time setting elements with the integrated circuit;

means for producing a time base signal;

means responsive to said time base signal and to the time setting signals for producing the controls signals, the control signals being applied to said first terminals;

means connected to selected ones of said first terminals and to selected ones of said second terminals for storing a data signal in response to a first predetermined combination of voltages applied simultaneously to said selected first terminals and to said selected second terminals, said data signal being determined by the control signals present at said selected first terminals; and

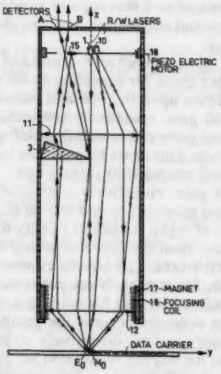
means connected to said storing means for performing an auxiliary function of the timepiece in response to said data signal.

4,345,321

SEMICONDUCTOR LASER SOURCE OPTICAL READING HEAD

Louis Arquie; Claude Bricot, and Michel Thirouard, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 24, 1980, Ser. No. 162,635
Claims priority, application France, Jun. 26, 1979, 79 16898
Int. Cl.³ G11B *7/12*
U.S. Cl. 369—46 **8 Claims**



2. An optical reading head comprising:

a semiconductor laser source having an emissive face in the shape of a rectangular window for producing an input light beam;

an optical projecting device for receiving said light beam and for forming a spot of light which is the image of said laser source in the plane of a reflective information carrier, whereby a reflected light beam is formed;

said emissive face being oriented so that said input light beam asymmetrically illuminates the entrance pupil of the optical projection device and said reflected light beam asymmetrically illuminates the entrance pupil of the optical projection device, whereby the portions of the optical projection device which are illuminated by the input and reflected beams are adjoining and include most of the area of said entrance pupil;

a deflecting member for receiving said reflected light beam from said optical projection device and for displacing the image formed in respect to said emissive face; and

detection cells for receiving said reflected beam from said deflecting member.

4,345,322

PICKUP CARTRIDGE FOR REPRODUCING SIGNALS RECORDED ON A 45-45 STEREOPHONIC RECORD DISK

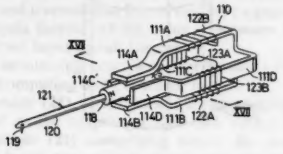
Kenshiro Aizawa, and Hisashi Okada, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Division of Ser. No. 931,728, Aug. 7, 1978, Pat. No. 4,238,646. This application Jul. 18, 1980, Ser. No. 169,987

Claims priority, application Japan, Aug. 10, 1977, 52-106790[U]; Aug. 12, 1977, 52-107865[U]; Dec. 23, 1977, 52-173676[U]; Jan. 7, 1978, 53-651[U]

Int. Cl.³ H04R 11/12

U.S. Cl. 369—139 11 Claims



1. A pickup cartridge for reproducing signals recorded in the form of undulations of surfaces of walls of a groove formed on a 45—45 stereophonic record disk, comprising:

a cantilever carrying, at its foremost end, a stylus tip for tracing the groove of said record disk, said stylus tip being movable in accordance with the undulations of the groove walls;

a magnet provided at a base end of said cantilever;

supporting means for supporting said cantilever so as to permit said cantilever to make swinging movement about a point in accordance with a movement of said stylus tip while preventing movement of the cantilever in an axial direction thereof;

at least one first pole piece made of a magnetic material and arranged along a first plane perpendicular to a surface of said record disk in flux-linking relationship with said magnet;

at least one second pole piece made of a magnetic material and arranged along a second plane parallel to said surface of the record disk in flux-linking relationship with said magnet;

at least one first yoke made of a magnetic material and magnetically coupled to said first pole piece to form, together with said first pole piece, at least one closed magnetic path for the passage of part of the magnetic flux produced by said magnet;

at least one second yoke made of a magnetic material and magnetically coupled to said second pole piece to form, together with said second pole piece, at least one closed magnetic path for the passage of part of the magnetic flux produced by said magnet;

first coil means wound around said first yoke whereby, in response to movement of the cantilever, said magnet induces in the first pole piece, the first yoke and the first coil means an electromotive force proportional to the component of velocity of movement of said stylus tip in a direction perpendicular to the surface of said record disk;

second coil means wound around said second yoke, whereby, in response to movement of the cantilever, said magnet induces in the second pole piece, the second yoke and the second coil means an electromotive force proportional to the component of velocity of movement of said stylus tip in a direction parallel to the surface of said record disk; and

means electrically coupling said first and second coils with one another to deliver the sum of, and the difference between, electromotive forces induced in the first and second coil means.

4,345,323

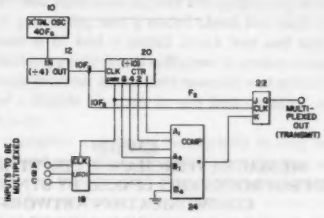
PULSE DURATION DIGITAL MULTIPLEXING SYSTEM

Paul S. Chang, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 7, 1980, Ser. No. 110,422

Int. Cl.³ H04J 15/00

U.S. Cl. 370—9 10 Claims



1. A multiplexing transmitter for simultaneous transmission of digital input signals over a single communication channel, comprising:

registration means for clocking-in said multiple input signals at a sampling frequency; and

binary counting means having multiple outputs sequentially activated according to a specific binary count for assigning each of said clocked-in signals a respective binary coded weight, so that a unique binary coded decimal value is specified by a combination of said coded weights of said clocked-in input signals, and said means including means for generating a pulse of a duration determined by said unique combined binary coded decimal value of said clocked-in input signals, and means for corresponding each of said input signals to a respective one of said counting means outputs.

4,345,324

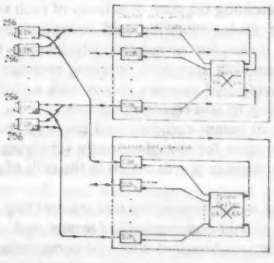
PROCESS AND SYSTEM FOR ERROR DETECTION IN A COMPUTER-CONTROLLED TELEPHONE EXCHANGE

Asbjorn Smitt, Vedbaek, Denmark, assignor to Christian Rovsing A/S, Denmark

Filed Jul. 9, 1980, Ser. No. 167,226

Int. Cl.³ H04J 3/14; H04M 3/24

U.S. Cl. 370—14 8 Claims



1. A method of supervising a plurality of data processing units in a redundant data processing system for controlling a telephone exchange having redundant digital switching networks, said processing units serving to set up and delete redundant communication channels through the switching networks, said method comprising the steps: of separately controlling the switching networks by the said processing units; and comparing time division multiplexed telecommunication data from associated sets of outlets from each of the redundant digital switching networks, a discrepancy in any one of said

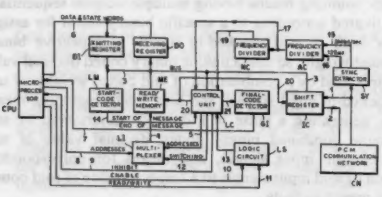
comparisons indicating an error in the set up by the controlling units of the respective communication channel through the switching networks.

4,345,325

MESSAGE-INTERCHANGE CIRCUITRY FOR MICROPROCESSORS LINKED BY SYNCHRONOUS COMMUNICATION NETWORK

Marco Gandini, and Ernesto Viale, both of Turin, Italy, assignors to Cselt-Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Apr. 18, 1980, Ser. No. 141,484
Claims priority, application Italy, Apr. 19, 1979, 67819 A/79
Int. Cl.³ H04J *3/02;* H04L *5/22*
U.S. Cl. 370—29 **6 Claims**



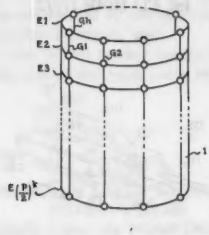
1. In a digital data-transmitting system, in combination:
a microprocessor:
synchronously operating communication means linking said microprocessor to at least one remote data-handling component;
read/write memory means having a transmitting area and a receiving area with cells for the temporary storage of outgoing message words destined for the remote data-handling component and of incoming message words destined for said microprocessor, respectively, along with information representing the state of activity of each storage area;
first circuit means coupling said microprocessor to said memory means for asynchronously loading the cells of said transmitting area with outgoing message words and for supplying said memory means with activity information relating to said transmitting area;
second circuit means coupling said memory means to said microprocessor for asynchronously supplying same with incoming message words stored in the cells of said receiving area;
input/output means connecting said transmitting and receiving areas to said communication means; and
a control unit synchronized with said communication means and responsive to activity information indicative of the presence of an outgoing message in said transmitting area for synchronously reading out the contents of the cells thereof to said communication means and further responsive to the arrival of a start code from said communication means for writing incoming message words into the cells of said receiving area along with activity information relating thereto, said control unit modifying the relevant activity information in said memory means upon completion of a message transfer between a storage area and said communication means.

4,345,326

SWITCHING NETWORK AND TELECOMMUNICATIONS CENTER COMPRISING SUCH A NETWORK

Marc P. G. Dieudonne, and Yves G. Raillard, both of Colombes, France, assignors to Le Materiel Telephonique Thomson-CSF, Colombes, France

Filed Jun. 11, 1980, Ser. No. 158,358
Claims priority, application France, Jun. 12, 1979, 79 14966
Int. Cl.³ H04Q *11/04*
U.S. Cl. 370—60 **6 Claims**



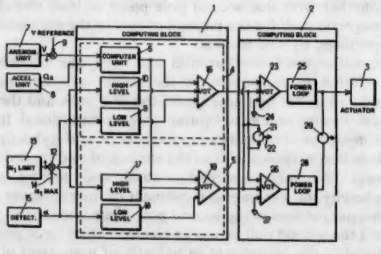
1. A switching network comprising N switching units, each switching unit being connected directly by p bilateral connections to other switching units of the network, p being an even integer greater than 2, wherein the switching units may be considered as located on h generatrices G1 to Gh, h being any integer, wherein each generatrix comprises $(p/2)^k$ switching units, numbered 1 to $(p/2)^k$, k being any integer, and wherein any switching unit of coordinates (i,j), i being the generatrix $(1 \leqq i \leqq h)$ on which the switching unit is located and j being the switching unit order number on the generatrix $(1 \leqq j \leqq (p/2)^k)$, is connected by p/2 connections to p/2 Ax-switching units $(1 \leqq x \leqq p/2)$ on the next generatrix, the coordinates of the Ax-switching units being: $((i+1)$ modulo h, $\{x+p/2(j-1)\}$ modulo $(p/2)^k)$.

4,345,327

SELF-MONITORED PROCESS CONTROL DEVICE

Pham D. Thuy, Chatenay Malabry, France, assignor to Societe Francaise d'Equipements pour la Navigation Aerienne, Velizy-Villacoublay, France

PCT No. PCT/FR79/00056, § 371 Date Mar. 7, 1980, § 102(e) Date Feb. 20, 1980, PCT Pub. No. WO80/00198, PCT Pub. Date Feb. 7, 1980
PCT Filed Jun. 29, 1979, Ser. No. 193,268
Claims priority, application France, Jul. 7, 1978, 78 20286
Int. Cl.³ G06F *11/18*
U.S. Cl. 371—9 **3 Claims**



1. A self-monitoring control device to control at least one actuator (3) which is controlled by a command signal,
means (7,8, and 9) for generating signals corresponding to sensed parameters upon which said control signal is based,

said control system comprising at least one digital computing channel (1) which includes:

a computing unit (6) operating in conjunction with said signal generator means (7,8,9) and producing an output signal;

two pairs of limiter circuits (10,11), (17,18), one circuit (10,17) of said each pair generating a signal representative of an upper limit value and the other circuit (11,18) generating a signal representative of a lower limit value;

two voters (16,19); circuit means for connecting one input of each of said two voters to the output of said computing unit (6), circuit means for connecting the other two inputs of one of said voters (16) to the outputs of both circuits of said two pairs of limiter circuits (10,11), circuit means for connecting the other two inputs of the other voter (19) to the outputs of both of the other pair of limiter circuits (17,18), each of said voters (16,19) comprising means to select and transmit that one of the three signals received at the inputs thereof whose value is between those of the other two input signals thereat,

said self-monitoring control system further comprising another computing unit (2) which includes:

a comparator (21), circuit means for connecting the inputs thereof to the outputs of said two voters (16,19), said comparator (21) comprising means for receiving said selected and transmitted signals and for transmitting a warning signal only when said two selected signals are not identical;

two interconnected voters (23,26) circuit means for connecting the outputs of both of said voters (16,19) as one of the inputs to each of said voters (23,26), means (24,27) for generating a reference signal; circuit means for connecting another input of each of said interconnected voters (23,26) to said reference signal generating means (24,27);

two power loops (25,28), circuit means for connecting the inputs of said power loops to the outputs of said interconnected voters (23,26);

circuit means for connecting the output from one of said power loops (25) to said actuator (3);

a comparator (29), circuit means for connecting the output of said comparator (29) to the outputs of both of said power loops (25,28),

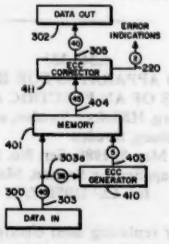
and said comparator being adapted to make a comparison between the output signals from said two power loops and to transmit a warning signal when said two power loop output signals are not identical.

4,345,328

ECC CHECK BIT GENERATION USING THROUGH CHECKING PARITY BITS

Gary D. White, Chanhassen, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,211
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—38 **6 Claims**



1. A memory system which provides single bit error correction/double bit error detection and through checking comprising:

an input data register capable of temporarily storing and outputting a data quantity having n data bit positions and x through checking parity bits;

a memory having a plurality of addressable locations input from said input data register wherein each of said plurality of addressable locations is capable of storing said data quantity and said x through checking parity bits and y coded check bits;

means input by said input data register and outputting to said memory for generating said y coded check bits such that the combination of said y coded check bits and said x through checking parity bits is sufficient to enable correction of a single bit error in said data quantity and to enable detection of a double bit error in said data quantity, and such that $n>2y$;

an output data register capable of temporarily storing said data quantity and said x through checking parity bits; and

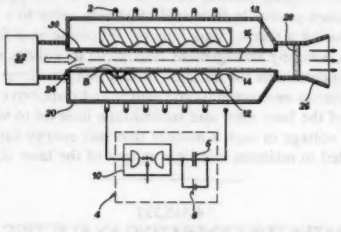
means input by said memory and outputting to said output data register for performing single bit error correction upon said data quantity received from said memory before transfer to said output data register.

4,345,329

FREE-ELECTRON LASER PROVIDED WITH A DEVICE FOR PRODUCING A PULSED MAGNETIC FIELD WITH PERIODIC SPATIAL VARIATIONS

Henri Doucet, Les Molieres, and Christian Tournes, Mareil Marly, both of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed Dec. 20, 1979, Ser. No. 105,784
Claims priority, application France, Dec. 22, 1978, 78 36123
Int. Cl.³ H01S *3/09*
U.S. Cl. 372—2 **5 Claims**



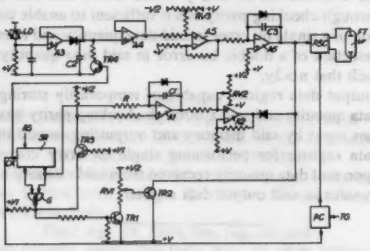
1. A free-electron laser comprising an electrically conductive winding, said winding having an axis, a current-pulse supply connected to said winding, said supply delivering current pulses having a duration, said duration defining a reciprocal duration, said winding so supplied by said current pulses constituting a pumping means, a split metallic tube placed inside said winding, said tube having a thickness and having an axis in coincidence with said axis of said winding, said tube having an inner wall, said wall being undulated periodically along the axis of the tube, said tube being formed of a conducting material having a skin-thickness at a frequency equal to said reciprocal duration of said current pulses, said skin-thickness being smaller than said thickness of the tube, a vacuum enclosure for sustaining a vacuum inside said tube, an electron source for injecting a beam of relativistic electrons into said tube in a direction parallel to the axis of said tube, said beam of electrons producing an electromagnetic radiation having a frequency and propagating in a direction parallel to the axis of the tube, said beam of electrons acting as an amplifying medium for said radiation, a vacuum-tight transparent window attached to the vacuum enclosure on the axis of said tube, said radiation emerging from said enclosure through said window and constituting the radiation delivered by said laser.

4,345,330

LASER ENERGY CONTROL CIRCUIT

James B. Howie, and John McLeod, both of Edinburgh, Scotland, assignors to Ferranti Limited, Cheadle, England

Filed Apr. 14, 1980, Ser. No. 140,007
Claims priority, application United Kingdom, Apr. 17, 1979, 7913353
Int. Cl.³ H01S 3/10
U.S. Cl. 372—29 8 Claims



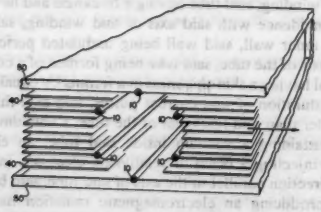
1. A laser energy control circuit for a gas-discharge-excited laser, which includes an energy source arranged to supply energy to the gas discharge at a rate determined by a control voltage, a first circuit connected to said source and arranged to deliver a first control voltage of such a value that the energy supplied is limited to a first value for a first time interval after initiation of the gas discharge, a second circuit connected to said source and arranged to deliver a second control voltage such that said energy supplied increases to a maximum value at the end of said first time interval and subsequently to change the control voltage in such a manner that said energy supplied is decreased gradually from said maximum value to a running value during a second time interval following said first time interval, a timing arrangement responsive to a series of clock pulses to determine the duration of said first time interval, and a third circuit connected to said source and responsive to light output of the laser after said second time interval to vary said control voltage in such a manner that said energy supplied is controlled to maintain said light output of the laser constant.

4,345,331

APPARATUS FOR GENERATING AN ELECTRIC FIELD

Ethan D. Hoag, East Boston, Mass., assignor to Locke Technology, Inc., Wakefield, Mass.

Filed Jan. 14, 1980, Ser. No. 111,718
Int. Cl.³ H01S 3/08
U.S. Cl. 372—87 33 Claims



1. Apparatus for generating an electric field within a region, said apparatus comprising:

an electrode assembly including a plurality of elongated electrodes disposed with their elongated axes substantially parallel to one another, substantially equidistantly from and angularly displaced from one another around a common axis so as to define said region; and

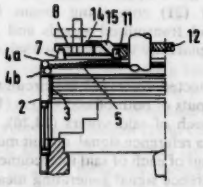
means for applying to said electrodes a harmonically varying, multi-phase potential so that the potential at each electrode is phase dependent and the phase of the potential at each electrode is a function of the relative angular position of that electrode so as to approximate a uniform electric field within said region.

4,345,332

COVER FOR VESSEL FOR A METAL MELTING FURNACE, IN PARTICULAR AN ELECTRIC ARC FURNACE

Bodo Wronka, Duisburg, Fed. Rep. of Germany, assignor to Mannesmann DeMag AG, Duisburg, Fed. Rep. of Germany

Filed Oct. 21, 1980, Ser. No. 199,310
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1979, 2943244
Int. Cl.³ F27D 1/12
U.S. Cl. 373—74 12 Claims



1. A metal melting furnace cover particularly suitable for an electric arc furnace comprising

(a) an outer cover frame,

(b) a cooling coil attached to said cover frame,

(c) the turns of said cooling coil being distributed generally across said cover frame,

(d) said cooling coil being formed as a self-supporting unit and having a centrally situated opening,

(e) a subframe,

(f) frame connecting means releasably connecting said subframe to said outer frame,

(g) said subframe extending generally in a plane parallel to the outer cover frame and being connectable to a hoisting device,

(h) a center disposed within the centrally situated opening of said cooling coil,

(i) said center being comprised at least partially of refractory material, and

(j) releasable, center suspending means for suspending said center from said subframe.

4,345,333

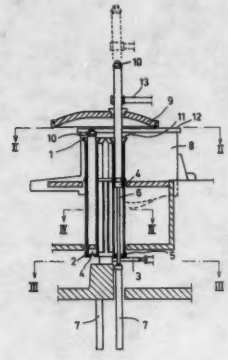
METHOD AND APPARATUS FOR REPLACING THE ELECTRODES OF AN ELECTRIC ARC FURNACE

Magnus G. G. Tiberg, Hällefors, Sweden, assignor to Aktiebolaget SKF, Gothenburg, Sweden

Filed May 8, 1980, Ser. No. 148,001
Claims priority, application Sweden, May 8, 1979, 7903987
Int. Cl.³ H05B 7/00
U.S. Cl. 373—94 8 Claims

5. Apparatus for replacing used electrodes with new electrodes of an electric arc furnace having a removable electrode roof actuatable between an inner position above the furnace and an outer position adjacent the furnace shell comprising a cartridge having a plurality of tubular members underlying the electrode roof in its outer position and adapted to receive the

new and used electrodes, aligning means for selectively situating the cartridge relative to the electrode roof to a first position



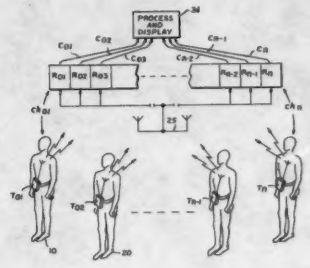
for inserting the used electrodes and to a second position for removal of the new electrodes from the cartridge.

4,345,334

REDUCED-CROSS TALK TELEMETRY SYSTEM AND METHOD OF MANUFACTURE THEREOF

John G. Nordahl, Lexington, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed May 5, 1977, Ser. No. 793,985
Int. Cl.³ H04B 7/015
U.S. Cl. 455—50 9 Claims



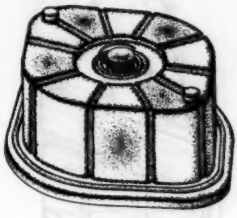
1. In a telemetry system having a plurality of transmitter-receiver channels within a predetermined band, the fundamental frequency of each transmitter channel being different and being a constant multiple of a respective basic frequency whereby spurious signals resulting from various multiples of each said basic frequency are present and may cross talk to receiver channels tuned thereto, the improvement wherein

each of the fundamental frequencies of said transmitter-receiver channels is a different one of at least some of the fundamental frequencies in a series of tentative fundamental frequencies, the successive fundamental frequencies in said series each having the same ratio to the immediately preceding fundamental frequency in said series.

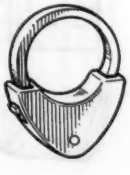
265,775
SUIT
James H. Crumley, South Arlington, Va., assignor to Bowing Enterprises, Arlington, Va.
Filed Jun. 25, 1980, Ser. No. 162,920
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—29

265,776
BOOT WITH ANGULARLY EXTENDING CLEATS
Michael Bell, P.O. Box 400, Warrington, Pa. 18976
Filed Apr. 7, 1980, Ser. No. 137,693
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—274

265,777
COMPUTER DISC CONTAINER
Lorene E. Elzea, Redwood City, and Robert G. Atwood, Foster City, both of Calif., assignors to Bozley, Inc., Foster City, Calif.
Filed Jun. 9, 1980, Ser. No. 157,322
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—35

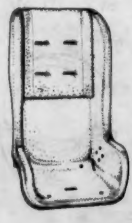


265,778
KEY HOLDER
Attilio Brentini, Le Château, Crissier, Switzerland (CH-1023)
Filed Jun. 5, 1980, Ser. No. 156,621
Claims priority, application Switzerland, Dec. 11, 1979, DM/000 051
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—61

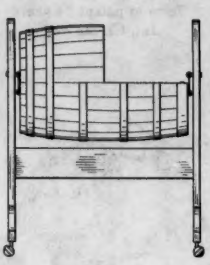


265,779
GARMENT BAG
Ted Stark, Jersey City, N.J., assignor to M & M Luggage Co., Inc., Jersey City, N.J.
Filed Mar. 9, 1981, Ser. No. 241,848
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

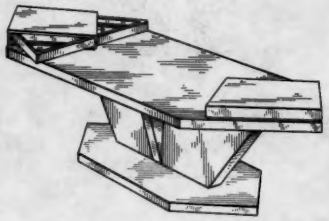
265,780
SAFETY CAR SEAT FOR A CHILD
Karl-Eric Johansson, Storgatan 55B, S-573 00 Tranas, Sweden
Filed Mar. 5, 1979, Ser. No. 17,359
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—9



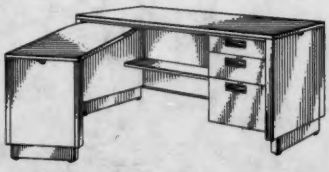
265,781
BABY CRADLE
Robert J. Dainty, Jr., 5347 E. 23rd St., Tulsa, Okla. 74114
Filed Jun. 4, 1979, Ser. No. 45,593
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—15



265,782
TABLE
James L. Ohle, 600 S. York Rd., Elmhurst, Ill. 60126
Filed Mar. 31, 1980, Ser. No. 135,275
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—146



265,783
DESK
Robert M. Fusselman, Youngstown, Ohio, assignor to GF Business Equipment, Inc., Youngstown, Ohio
Filed Oct. 1, 1979, Ser. No. 81,251
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—162

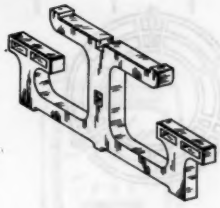


265,784
DISPLAY RACK
Ruth E. Saltzman, P.O. Box 25029, Portland, Oreg. 97225
Filed Mar. 19, 1979, Ser. No. 21,469
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—180

265,785
EASEL
John M. Weiskopf, 4240 37th St., #B, San Diego, Calif. 92105
Filed Mar. 10, 1980, Ser. No. 129,098
Term of patent 14 years
Int. Cl. D6—*06, 99*
U.S. Cl. D6—180

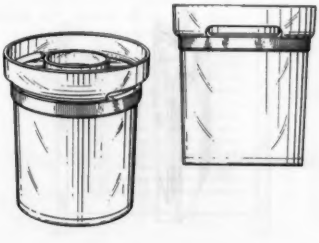
265,786
EASEL
S. Ralph Angell, 2851 Treasure Island West, Memphis, Tenn. 38115
Filed Jun. 16, 1980, Ser. No. 159,933
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—180

265,787
END SUPPORT FOR A COMBINED TABLE AND BENCH UNIT
DeWayne D. Berquist, Anoka, Minn., assignor to Aggressive Industries, Inc., Minneapolis, Minn.
Filed Sep. 16, 1980, Ser. No. 188,001
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—196



265,788
FINGER FOOD ATTACHMENT TRAY FOR A SAUCER
Moyle A. Swinn, Apt. 716 - 1170 Ramsey View Crescent, Sudbury, Ontario, Canada (P3E 2E4)
Filed May 16, 1978, Ser. No. 906,336
Claims priority, application Canada, Dec. 20, 1977, 2012771
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—39

265,789
ICE BUCKET
Edgar F. Trombly, Grosse Pointe Farms, Mich., assignor to Thermo Serv, Inc., Anoka, Minn.
Filed Oct. 8, 1980, Ser. No. 195,046
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—78

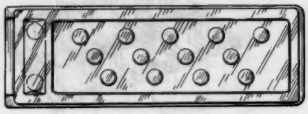


265,790
RACK
Andrew V. Taylor, Sydney, Australia, assignor to Tayclox Industries Pty. Limited, Hornsby, Australia
Filed May 16, 1980, Ser. No. 150,611
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—130

265,791
SHINGLE DIGGER
Gabriel J. Fieni, Douglassville, Pa. 19518
Filed Aug. 22, 1979, Ser. No. 68,629
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—88

265,792
WEDGE CLAMP FOR PANELS OR THE LIKE
Russell K. Winter, Crownsville; Nedim Savas, Wheaton; Joseph H. Snively, Bethesda, and Thomas D. Harvey, Silver Spring, all of Md., assignors to Russell William Ltd., Columbia, Md.
Filed Jun. 16, 1980, Ser. No. 159,860
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—394

265,793
TABLET DISPENSER
Newton C. Owen, Flemington, and Horace Carver, Frenchtown, both of N.J., assignors to Ortho Diagnostics, Inc., Raritan, N.J.
Filed May 9, 1980, Ser. No. 148,423
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—341

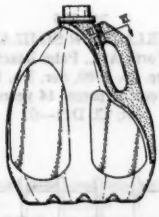


265,794
BOTTLE
Joseph Helfrich, Bouxwiller, France, assignor to Les Grands Chais deFrance, Bouxwiller, France
Filed Oct. 5, 1979, Ser. No. 82,304
Claims priority, application France, Apr. 6, 1979, 358
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—370

265,795
BOTTLE
Keith S. Keith, Hollywood; Stephen G. Hauser, Tarzana, both of Calif., and Danny J. Beach, Kearney, Mo., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.
Filed Jan. 24, 1980, Ser. No. 114,875
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—370

265,796
BOTTLE
Donald P. Denhoff, Marietta, Ga., assignor to Sewell Plastics, Inc., Atlanta, Ga.
Filed Jul. 10, 1980, Ser. No. 167,534
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—378

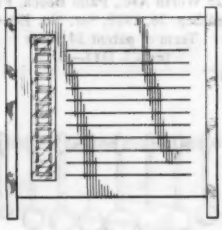
265,797
JUG
Richard L. Platte, 250 Sumac La., Ann Arbor, Mich. 48105
Filed Jul. 25, 1980, Ser. No. 172,299
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—378



265,798
BEVERAGE CONTAINER
Giuseppe Ossola, Brescia, Italy, assignor to Idropejo S.p.A., Cogolo di Pejo, Italy
Filed Aug. 21, 1980, Ser. No. 180,231
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—429

265,799
WRISTWATCH
Takao Suzuki, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan
Filed Sep. 18, 1980, Ser. No. 188,375
Claims priority, application Japan, Mar. 26, 1980, 55-11771
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

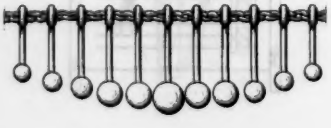
265,800
NOVELTY THERMORESPONSIVE LIQUID CRYSTAL INDICATING DEVICE
Charles Butera, and Ingela Butera, both of 2000-67 S. Escondido Blvd., Escondido, Calif. 92025
Filed May 14, 1979, Ser. No. 38,526
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57



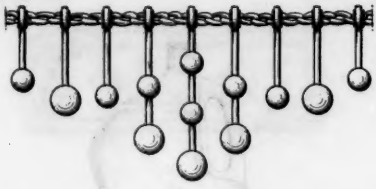
265,801
SENSOR FOR SOLAR AND WIND ENERGY MONITOR
Gaylord B. Buck, Denver, Colo., assignor to Aero Systems Research, Inc., Englewood, Colo.
Filed May 15, 1980, Ser. No. 150,193
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96

265,802
ANNUNCIATOR
Dana L. Vickery, Gardner, Mass., assignor to Simplex Time Recorder Co., Gardner, Mass.
Filed Apr. 14, 1980, Ser. No. 140,271
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—118

265,803
PEARL NECKLACE OR SIMILAR ARTICLE
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Sep. 26, 1980, Ser. No. 191,432
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—8



265,804
PEARL NECKLACE OR SIMILAR ARTICLE
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Sep. 26, 1980, Ser. No. 191,436
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—8



265,805
PEARL NECKLACE OR SIMILAR ARTICLE
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Sep. 26, 1980, Ser. No. 191,437
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—8

265,806
PEARL NECKLACE OR SIMILAR ARTICLE
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Sep. 26, 1980, Ser. No. 191,438
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—8

265,807
PEARL NECKLACE OR SIMILAR ARTICLE
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Sep. 26, 1980, Ser. No. 191,439
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—8

265,808
FINGER RING OR SIMILAR ARTICLE
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Aug. 7, 1980, Ser. No. 176,121
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—26

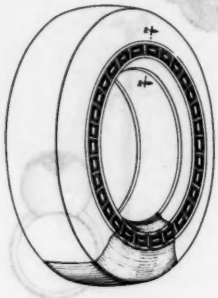
265,809
FINGER RING OR SIMILAR ARTICLE
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Aug. 7, 1980, Ser. No. 176,123
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—34

265,810
FINGER RING OR SIMILAR ARTICLE
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Aug. 7, 1980, Ser. No. 176,124
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—34

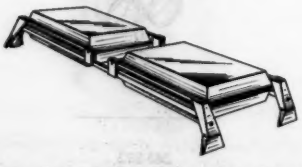
265,811
EARRING
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Aug. 7, 1980, Ser. No. 176,130
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—76

265,812
CRANK ARM FOR A BICYCLE CRANK ASSEMBLY
B. Linn Kastan, 724 Primrose La., Thousand Oaks, Calif. 91360
Filed May 27, 1980, Ser. No. 153,531
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—123

265,813
TIRE
Donald J. Sladky, Cuyahoga Falls, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio
Filed Apr. 3, 1980, Ser. No. 136,857
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—152

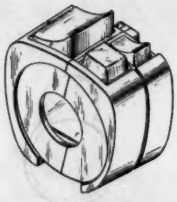


265,814
SKI AND LUGGAGE CARRIER FOR VEHICLES
Jan-Erik Brorsson, Höggatan 10, S-510 54 Brämhult, Sweden
Filed May 6, 1980, Ser. No. 147,070
Claims priority, application Sweden, Nov. 13, 1979, 792497
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157

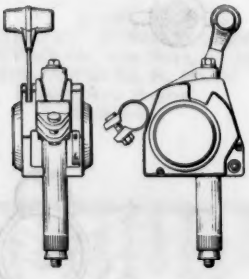


265,815
VAN ROOF RACK
John P. Francis, 13 Elm St., Brookline, Mass. 02146
Filed Jun. 16, 1980, Ser. No. 160,103
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157

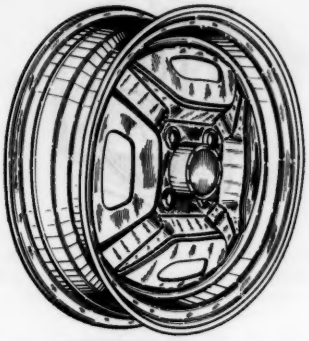
265,816
MOTORCYCLE HANDGRIP CONTROL
Daniel A. Matre, Milwaukee, Wis., assignor to Harley Davidson Motor Co., Inc., Milwaukee, Wis.
Filed May 30, 1980, Ser. No. 154,698
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—174



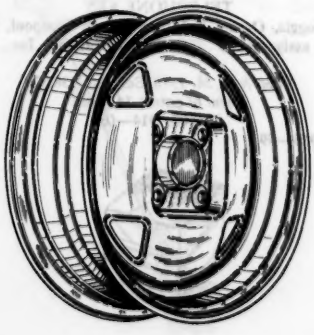
265,817
DESIGN FOR A BICYCLE GEAR SHIFTER
Daniel G. Hahn, Olney, Ill., assignor to AMF Incorporated, White Plains, N.J.
Filed Feb. 14, 1980, Ser. No. 121,558
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—179



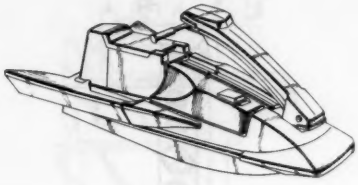
265,818
VEHICLE WHEEL
Donald J. Reid, Pleasant Ridge, Mich., assignor to Kelsey-Hayes Co., Romulus, Mich.
Filed Jan. 25, 1980, Ser. No. 115,318
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



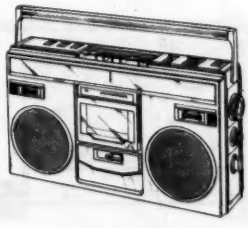
265,819
VEHICLE WHEEL
Donald J. Reid, Pleasant Ridge, Mich., assignor to Kelsey-Hayes Co., Romulus, Mich.
Filed Jan. 25, 1980, Ser. No. 115,540
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



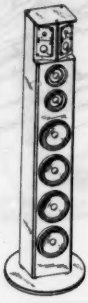
265,820
MOTOR BOAT
Keisuke Tomonaga, Akashi; Hiroshi Nishida, and Takeshi Miyazaki, both of Miki, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan
Filed Apr. 16, 1980, Ser. No. 140,683
Claims priority, application Japan, Oct. 18, 1979, 54-43792
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—307



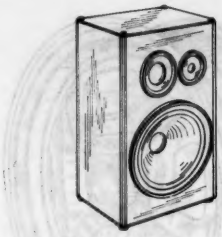
265,821
COMBINED CASSETTE RECORDER AND RADIO RECEIVER
Takao Okada, Kyoto; Setsuo Miyanaga, Neyagawa, and Benito Mishiro, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Feb. 4, 1980, Ser. No. 117,925
Claims priority, application Japan, Aug. 2, 1979, 54-32436
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—5



265,822
LOUDSPEAKER COLUMN
Peter Hartwein, Koenigstein, and Peter Schneider, Kronberg, both of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany
Filed Aug. 22, 1979, Ser. No. 68,714
Term of patent 3½ years
Int. Cl. D14—*01*
U.S. Cl. D14—34

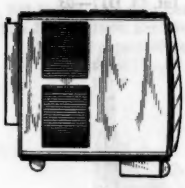


265,823
LOUDSPEAKER
Peter Hartwein, Königstein, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany
Filed Aug. 22, 1979, Ser. No. 68,718
Term of patent 3½ years
Int. Cl. D14—*01*
U.S. Cl. D14—34



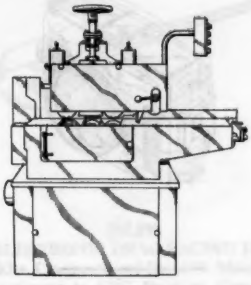
265,824
TELEPHONE KEY
Donald Foggia, Ocean, N.J., and Roman Pomponi, Norwalk, Conn., assignors to TIE/Communications, Inc., Shelton, Conn.
Filed Aug. 24, 1978, Ser. No. 936,337
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—59

265,825
COLOR TELEVISION RECEIVER
Ennio Brion, Milan, Italy, assignor to Brionvega S.p.A., Milan, Italy
Filed Jan. 4, 1980, Ser. No. 109,682
Claims priority, application Italy, Jul. 11, 1979, 35USC119
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—81

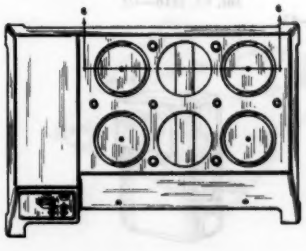


265,826
ELECTRIC CULTIVATOR
Ronald J. Holmstadt, Bloomington, Minn.; L. Ralph Sorge, New Canaan, and Robert J. Tiedemann, Stamford, both of Conn., assignors to The Toro Company, Minneapolis, Minn.
Filed May 12, 1980, Ser. No. 149,273
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—12

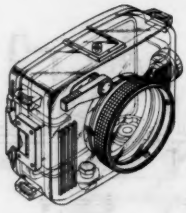
265,827
SHORT LENGTH GANG RIP SAW
Walter O. Paulson, Jr., 1433 NW. Quimby, Portland, Oreg. 97209
Filed Jun. 21, 1979, Ser. No. 50,657
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—133



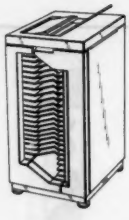
265,828
ELECTROPLATER
Harold Jaffe, Perrysburg; Roberto Blinder, and Lowell J. Jaffe, both of Toledo, all of Ohio, assignors to Jaffe Manufacturing Company, Toledo, Ohio
Filed Jul. 25, 1979, Ser. No. 60,808
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—144



265,829
WATERPROOF HOUSING FOR CAMERA
Tsunezo Shimoda, Kamakura, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Aug. 26, 1980, Ser. No. 181,630
Claims priority, application Japan, Feb. 27, 1980, 55-007250
Term of patent 7 years
Int. Cl. D16—*01*
U.S. Cl. D16—2



265,830
SORTER FOR ELECTROSTATIC COPIER
Kenichi Nakade, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan
Filed Sep. 11, 1980, Ser. No. 186,530
Claims priority, application Japan, Mar. 11, 1980, 55-009352
Term of patent 7 years
Int. Cl. D16—*03*
U.S. Cl. D16—32



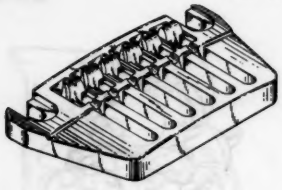
265,831
ELECTRONIC FLASH DEVICE
Herbert Schultes, Fürstenfeldbruck, and Karl-Heinz Rubner, Munich, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany
Filed Jul. 31, 1980, Ser. No. 175,189
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—42

265,832
ELECTRIC ORGAN
Yasuhiro Kira; Yoshiro Watabiki; Nobushiro Aiba, and Katsumi Koyama, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan
Filed Oct. 2, 1980, Ser. No. 193,521
Claims priority, application Japan, Apr. 5, 1980, 55-13.453
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D17—5

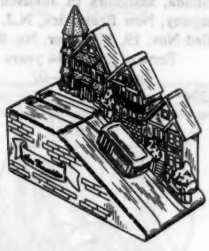
265,833
BASS GUITAR OR SIMILAR ARTICLE
Michael N. Sciuto, Apt. E, 503 Castle Dr., Baltimore, Md. 21212
Filed Apr. 29, 1980, Ser. No. 144,939
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—14

265,834
BASS GUITAR OR SIMILAR ARTICLE
Michael N. Sciuto, Apt. E, 503 Castle Dr., Baltimore, Md. 21212
Filed Apr. 29, 1980, Ser. No. 144,940
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—14

265,835
STRINGED INSTRUMENT COMBINED BRIDGE AND TAILPIECE
James H. Rickard, Harwinton, Conn., assignor to Ovation Instruments, Inc., Bloomfield, Conn.
Filed Jun. 23, 1980, Ser. No. 162,388
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—21



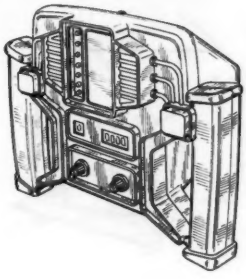
265,836
MUSIC BOX
Chong T. Ahn, 923 Fulton Ave., San Leandro, Calif. 94577
Filed Jul. 25, 1980, Ser. No. 172,713
Term of patent 14 years
Int. Cl. D17—*05*
U.S. Cl. D17—24



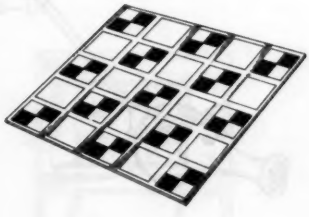
265,837
ELECTRONIC CALCULATING MACHINE
Masafumi Yamagami, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jan. 9, 1980, Ser. No. 110,643
Claims priority, application Japan, Jul. 12, 1979, 54-29189
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7

265,838
DISPOSABLE RECORDING PEN WITH INK RESERVOIR
John G. Bunning, Orange County, Calif., assignor to Esterline Angus Instrument Corporation, Indianapolis, Ind.
Filed Sep. 15, 1980, Ser. No. 187,212
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—41

265,839
ELECTRONIC DRAG RACING TOY
Kenneth M. Kite, Cincinnati, and David W. Moine, Canton, both of Ohio, assignors to CPG Products Corp., Minneapolis, Minn.
Filed Jun. 13, 1980, Ser. No. 159,401
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13

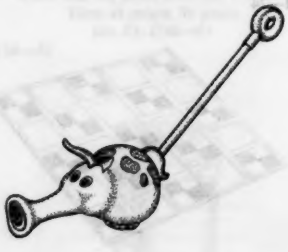


265,840
GAME BOARD
Luis Campos, 8454 Sharp Ave., Sun Valley, Calif. 91352
Filed Aug. 26, 1980, Ser. No. 181,641
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—24

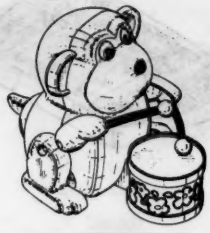


265,841
COMBINED TOY AIRPLANE AND FIGURE THEREFOR
Wai-Kuen Tung, Kowloon, Hong Kong, assignor to The Best Toys Co. Ltd., Kowloon, Hong Kong
Filed Feb. 2, 1981, Ser. No. 230,373
Claims priority, application United Kingdom, Oct. 20, 1980, 997123
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—90

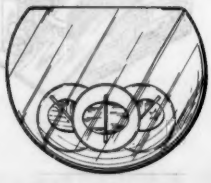
265,842
ANIMAL PUSH TOY
Michael Conners, and Thomas P. Osborne, both of Cincinnati, Ohio, assignors to CPG Products Corp., Minneapolis, Minn.
Filed Jan. 26, 1979, Ser. No. 6,603
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150



265,843
ANIMAL FIGURE TOY
Wai K. Tung, Kowloon, Hong Kong, assignor to The Best Toys Co., Ltd., Kowloon, Hong Kong
Filed Aug. 4, 1980, Ser. No. 174,846
Claims priority, application United Kingdom, Feb. 8, 1980, 993551
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—156

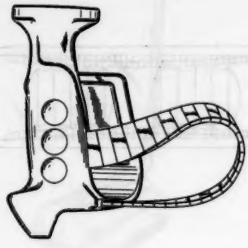


265,844
COMBINED BALL COLLECTION AND RECEPTACLE
Danny E. Simpson, Baltimore, Md., and David M. Williams, Montreal, Canada, assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.
Filed Nov. 19, 1979, Ser. No. 95,828
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—204

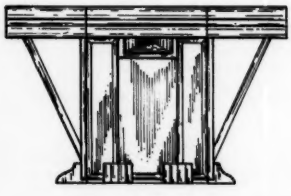


265,845
LACROSSE STICK HEAD
WilliamH. Brine, Jr., Weston, and Peter J. Brine, Wellesley, both of Mass., assignors to W. H. Brine Company, Milford, Mass.
Filed Nov. 24, 1980, Ser. No. 209,335
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—210

265,846
HANDLE FOR SKI POLE
Helmut Scholz, Pferrenberg, Fed. Rep. of Germany, assignor to DSI-Sportartikel GmbH, Weltnau, Fed. Rep. of Germany
Filed Apr. 16, 1980, Ser. No. 140,859
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1979, 180W
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—230

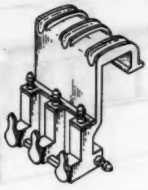


265,847
GAME TABLE
Vernon C. Nielsen, 1551 E. 1700 South, Salt Lake City, Utah 84101
Filed Feb. 11, 1980, Ser. No. 120,260
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—232



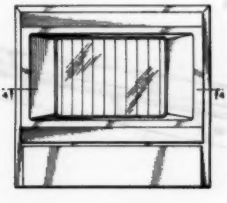
265,848
HIGH PRESSURE COVER
Tord G. I. Johansson, Karlsängen, S-760 21 VäTö, Sweden
Filed Jun. 11, 1979, Ser. No. 47,257
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1978, URA 1220/78
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—1

265,849
AQUARIUM GANG VALVE
Ying-Young Ng, Chai Wan, Hong Kong, assignor to Veny Plastic Co., Ltd., Hong Kong, Hong Kong
Filed Jun. 2, 1980, Ser. No. 155,067
Claims priority, application United Kingdom, Dec. 19, 1979, 79992924
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

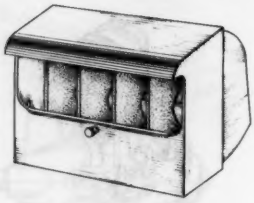


265,850
HEATING STOVE
Arnie C. Bradford, Rte. 4, Box 210, Burnsville, N.C. 28714
Filed Jul. 28, 1980, Ser. No. 173,087
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

265,851
FACIA FOR A DOMESTIC HEATING APPLIANCE
Thomas A. Babbage, Walton-on-Thames, England, assignor to Trianco Redfyre Limited, Surrey, England
Filed May 28, 1980, Ser. No. 153,945
Claims priority, application United Kingdom, Nov. 29, 1979, 992609
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—128

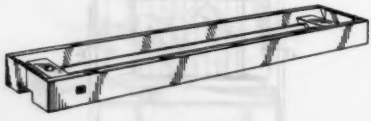


265,852
ROOM HUMIDIFIER
James E. Vesper, 2408 Stratton Dr., Potomac, Md. 20854
Filed Sep. 19, 1980, Ser. No. 189,384
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—147

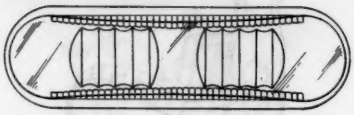


265,853
ORTHOPEDIC GARMENT
Dennis V. Meloy, Jackson, Mich., assignor to Camp International, Inc., Jackson, Mich.
Filed Jan. 24, 1980, Ser. No. 115,109
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—64

265,854
LIGHTING FIXTURE FOR PARTITION WALLS
Paul R. Maguire, 4284 Sea View La., Los Angeles, Calif. 90065
Filed Dec. 3, 1979, Ser. No. 99,660
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—78



265,855
MARKER LAMP LENS
Karel Urbanek, Weston, and Arthur F. Bleiweiss, Toronto, both of Canada, assignors to Dominion Auto Accessories Limited, Toronto, Canada
Filed Apr. 2, 1979, Ser. No. 25,775
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D26—122



265,856
COMBINED AQUARIUM AND AVIARY
Clayton Totten, P.O. Box 66, Sedalia, N.C. 27342
Filed Jan. 21, 1980, Ser. No. 113,598
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—11

265,857
CARPET CLEANING TOOL
Jack L. Burgoon, Toledo, Ohio, and John M. Hayes, Indianapolis, Ind., assignors to The Scott & Fetzer Company, Lakewood, Ohio and Earl Grissmer Company, Inc., Indianapolis, Ind.
Filed Mar. 20, 1980, Ser. No. 132,278
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—32

265,858
LIQUID DISPENSER HANDLE FOR HOUSEHOLD SCRUBBING PAD
John W. Spirk, Jr., Cleveland Heights, Ohio, assignor to Transco Plastics Corporation, Bedford Heights, Ohio
Filed Jun. 27, 1980, Ser. No. 163,802
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—35

265,859
COMBINED POST AND MAIL BOX
William K. Gross, 4767 Bilmark Ave., Fort Myers, Fla. 33901
Filed Oct. 17, 1979, Ser. No. 85,658
Term of patent 14 years
Int. Cl. D99—*00*
U.S. Cl. D99—32

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF AUGUST, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.P.M. Wood Products Pty. Ltd.: *See*—
Willington, John M., 4,344,237, Cl. 34-191.000.

Aaby, Trygve; and Rosenberg, Barnett. Microprobe for monitoring biophysical phenomena associated with cardiac and neural activity. 4,344,440, Cl. 128-653.000.

Aaron, Robert L.; and Murphy, Eugene F., to International Telephone and Telegraph Corporation. Vehicle mounted mobile business data handling system. 4,345,147, Cl. 235-385.000.

AB Ferrosan: *See*—
Hernestam, Sven E. H.; Martinsson, Kjell B.; Christensson, Erik G.; and Olsson, Nils-Goran E., 4,344,952, Cl. 424-267.000.

Abbin, Joseph P., Jr.; Devaney, Howard F.; and Hake, Lewis W., to United States of America, Energy. Acceleration switch. 4,345,124, Cl. 200-61.530.

Abbott Laboratories: *See*—
Larkin, Mark E.; and Balistreri, Thomas W., 4,344,472, Cl. 150-8.000.

Abex Corporation: *See*—
Farr, Aaron V.; and Saunders, Robert L., 4,344,200, Cl. 14-71.500.

Academy of Applied Science, Inc., The: *See*—
Wyckoff, Charles W., 4,345,023, Cl. 430-364.000.

Acco Industries Inc.: *See*—
Gilmore, William J., 4,344,518, Cl. 192-111.00A.

Achtnig, Klaus-Peter: *See*—
Forberg, Horst; and Achtnig, Klaus-Peter, 4,345,294, Cl. 361-119.000.

Adams, John B., Jr. Aqueous fungicidal formulations and their preparation. 4,344,890, Cl. 260-429.00K.

Adamski, John L., to Boeing Company, The. Electrode having spiral-shaped electrically conducting regions therein useful as an anode in electron beam discharge devices. 4,345,182, Cl. 313-348.000.

Adolphi, Heinrich: *See*—
Schwarz, Gerd-Ulrich; Kiehs, Karl; and Adolphi, Heinrich, 4,344,961, Cl. 424-285.000.

Advance Valve Installations: *See*—
Galos, Imre, 4,344,460, Cl. 138-89.000.

AEG-Telefunken Aktiengesellschaft: *See*—
Hasse, Peter; Wiesinger, Johannes; and Pivit, Erich, 4,345,293, Cl. 361-117.000.
Hasse, Peter; Wiesinger, Johannes; and Pivit, Erich, 4,345,295, Cl. 361-130.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Doucet, Henri; and Tournes, Christian, 4,345,329, Cl. 372-2.000.

Agency of Industrial Science and Technology: *See*—
Ishii, Yoshiaki; Kume, Tsutomu; Ando, Naoyoshi; and Fujinami, Shosaku, 4,344,373, Cl. 110-347.000.

Agfa-Gevaert AG: *See*—
Gref, Hans, 4,344,552, Cl. 226-95.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Birgmeir, Klaus; and Stadler, Klaus, 4,344,666, Cl. 350-6.900.
Stemme, Otto, 4,344,683, Cl. 354-106.000.
Stemme, Otto; Lermann, Peter; and Cocron, Istvan, 4,344,686, Cl. 354-198.000.
Thurm, Siegfried; and Bunge, Konrad, 4,344,704, Cl. 355-77.000.
Viehrig, Wolfgang; Osegowitsch, Viktor; and Hammer, Thomas, 4,344,690, Cl. 354-319.000.

Aguilar, Abel. Dry dentifrice powders. 4,344,931, Cl. 424-52.000.

Aho, Wilho V., Jr.: *See*—
Trenschel, Donald R.; and Aho, Wilho V., Jr., 4,344,740, Cl. 416-221.000.

Air Products and Chemicals, Inc.: *See*—
Boyle, John F.; Halper, Barry J.; Link, James C.; and Mullane, John C., Jr., 4,344,290, Cl. 62-48.000.
Hyman, Floyd L.; and Ziv, Martin H., 4,345,079, Cl. 544-351.000.

Air Rail, Inc.: *See*—
Masterson, Robert C., Jr.; Thomas, R. Gordon; and Johnson, John G., 4,344,656, Cl. 303-2.000.

Aisan Kogyo Kabushiki Kaisha: *See*—
Takada, Shigetaka; and Satoh, Yoji, 4,344,898, Cl. 261-39.00E.

Aisin Seiki Company, Limited: *See*—
Iwasaki, Shinichiro, 4,344,331, Cl. 73-861.760.

Aisin Seiki Kabushiki Kaisha: *See*—
Amano, Hiroyuki; Yoshida, Tsuyoshi; and Shibata, Kazuhiko, 4,345,240, Cl. 340-345.000.
Kawai, Shunichi, 4,344,335, Cl. 74-674.000.

Aisin-Waner Kabushiki Kaisha: *See*—
Amano, Hiroyuki; Yoshida, Tsuyoshi; and Shibata, Kazuhiko, 4,345,240, Cl. 340-345.000.

Aizawa, Kenshiro; and Okada, Hisashi, to Nippon Gakki Seizo Kabushiki Kaisha. Pickup cartridge for reproducing signals recorded on a 45-45 stereophonic record disk. 4,345,322, Cl. 369-139.000.

Ajinomoto Company Incorporated: *See*—
Sugiyama, Katsumi; Takeda, Hideo; and Sato, Hiroko, 4,345,091, Cl. 560-163.000.

Akagi, Noriyuki; Ogawa, Yoshinari; and Sakai, Kouichi, to Teijin Limited. Polyethylene terephthalate resin compositions. 4,344,874, Cl. 524-296.000.

Akita, Sigeyuki: *See*—
Fujiwara, Toshitaka; Nabeta, Teiichi; Akita, Sigeyuki; and Kitagawa, Junji, 4,344,293, Cl. 62-126.000.

Aktiebolaget SKF: *See*—
Tiberg, Magnus G. G., 4,345,333, Cl. 373-94.000.

Akzo NV: *See*—
Wick, Gerhard, 4,344,873, Cl. 528-58.000.

Aladdin Industries, Incorporated: *See*—
Frazier, Albert A., 4,344,548, Cl. 222-209.000.

Albert, Stuart. Method and apparatus for inducing psychological responses. 4,344,759, Cl. 434-236.000.

Albertazzi, Gastone, to Finike Italiana Marposs S.p.A. Apparatus for checking diametral dimensions. 4,344,233, Cl. 33-178.00E.

Albin, Michael J., to Equipment Company of America. Transportable apparatus for cutting and dispensing roll material. 4,344,551, Cl. 225-86.000.

Albring, Manfred: *See*—
Wiechert, Rudolf; Bittler, Dieter; Schleusener, Annerose; and Albring, Manfred, 4,344,941, Cl. 424-243.000.

Alcan Aluminum Corporation: *See*—
Wollam, Carl A.; Gailey, J. Lynn; and Chalmers, Alexander A., 4,344,990, Cl. 427-286.000.

Alcan Research and Development Limited: *See*—
Peck, Albert W., 4,344,508, Cl. 187-9.00R.

Aldrich, Roger B.; and White, Gary R., to Chief Industries, Inc. Alignment apparatus. 4,344,314, Cl. 72-461.000.

Alfa-Laval AB: *See*—
Bladh, Per, 4,344,976, Cl. 426-472.000.

All, Frank E.; and Duncan, Gary L., to Mobil Oil Corporation. Oriented polypropylene film substrate and method of manufacture. 4,345,005, Cl. 428-461.000.

Allaway, Philip N.; Baginski, Richard M.; Liu, Don K. K.; and Teixeira, Theodore M., to Procter & Gamble Company, The. Spray-dried aluminosilicate detergents containing silicate and metaborate. 4,344,871, Cl. 252-531.000.

Allemand, Robert; and Laval, Michel, to Commissariat a l'Energie Atomique. Radiation detector for use in X-ray tomography. 4,345,155, Cl. 250-385.000.

Allen, Gordon H.; and Neidorff, Robert A., to Motorola, Inc. Current source having saturation protection. 4,345,166, Cl. 307-296.00R.

Alley, Robert P.; and Tompkins, Russell E., to General Electric Company. Amorphous metal ballasts and reactors. 4,345,229, Cl. 336-83.000.

Allied Tube & Conduit Corporation: *See*—
Ostrowski, Arthur E.; and Polich, Joseph M., 4,344,381, Cl. 118-626.000.

Allis-Chalmers Corporation: *See*—
Murray, Donald L., 4,344,519, Cl. 193-2.00R.

Aloka Co., Ltd.: *See*—
Yoshikawa, Yoshihiro; Katabami, Takao; Fujinaga, Katsumi; and Kobayashi, Yoshiaki, 4,344,327, Cl. 73-626.000.

ALZA Corporation: *See*—
Bonsen, Pieter; Wong, Patrick S.; and Theeuwes, Felix, 4,344,929, Cl. 424-15.000.

Amada, Nobutaka; and Inoue, Shigeki, to Hitachi, Ltd. Audio frequency power amplifier circuit. 4,345,215, Cl. 330-268.000.

Amano, Hiroyuki; Yoshida, Tsuyoshi; and Shibata, Kazuhiko, to Aisin Seiki Kabushiki Kaisha; and Aisin-Waner Kabushiki Kaisha. Throttle opening sensor. 4,345,240, Cl. 340-345.000.

AMCOR Ltd.: *See*—
Yavnieli, Mordechai, 4,344,776, Cl. 55-129.000.

American Can Company: *See*—
Cherney, Jerome A.; and Pawlowski, Thomas D., 4,345,133, Cl. 219-10.55E.
Schroeder, Roger A., 4,344,584, Cl. 242-56.00A.

American Cyanamid Company: *See*—
Giglia, Robert D., 4,344,674, Cl. 350-357.000.
Mueller, Michael J.; and Montgomery, Carroll S., 4,345,094, Cl. 562-425.000.
Mueller, Michael J.; and Montgomery, Carroll S., 4,345,095, Cl. 562-425.000.
Tomcufcik, Andrew S.; Wright, William B., Jr.; and Marsico, Joseph W., Jr., 4,344,954, Cl. 424-270.000.

American Hoechst Corporation: *See*—
McFadden, Arthur R.; and Aultz, Daniel E., 4,345,087, Cl. 549-44.000.

Ong, Helen H.; and Profitt, James A., 4,345,081, Cl. 546-17.000.
American Home Products Corporation: *See—*
Martin, Frederick H.; and Tsuk, Andrew G., 4,344,934, Cl. 424-80.000.
American Optical Corporation: *See—*
Nordahl, John G., 4,345,334, Cl. 455-50.000.
American Safety Equipment Corp.: *See—*
Hollowell, William; Tanaka, Akira; Ziv, Avraham; and Stamboulian, Nazareth, 4,344,588, Cl. 242-107.40A.
Ametek, Inc.: *See—*
Fulop, Gabor F.; Betz, Jacob F.; Meyers, Peter V.; and Doty, Mitchell E., 4,345,107, Cl. 136-255.000.
AMP Incorporated: *See—*
Chang, Paul S., 4,345,323, Cl. 370-9.000.
Corman, Ned E.; Kandybowski, Steven J.; Scheingold, William S.; and Youngfleish, Frank C., 4,345,267, Cl. 357-81.000.
Johnson, Keith, Jr.; and Long, Robert A., 4,344,225, Cl. 29-857.000.
Racilla, John J.; and Weber, Robert N., 4,344,665, Cl. 339-99.00R.
Amsted Industries Incorporated: *See—*
Schuricht, Henry A., 4,344,332, Cl. 74-54.000.
Amtrol Inc.: *See—*
Kirk, Kenneth L., 4,344,645, Cl. 285-61.000.
Anders, Larry E., to United Technologies Corporation. Compressor bleed system. 4,344,282, Cl. 60-226.00R.
Anderson, John: *See—*
Columbus, Peter S.; and Anderson, John, 4,345,044, Cl. 523-220.000.
Anderson, Paul L.; and Brittain, Darryl A., to Sandoz, Inc. Anti-inflammatory 1-alkyl-1-phenyl-butanes. 4,344,966, Cl. 424-343.000.
Anderson, Richard N. Window structure. 4,344,257, Cl. 49-504.000.
Andersson, Sture, to Tex Innovation AB. Method and apparatus for packaging commodities. 4,344,270, Cl. 53-511.000.
Ando, Naoyoshi: *See—*
Ishii, Yoshiaki; Kume, Tsutomu; Ando, Naoyoshi; and Fujinami, Shosaku, 4,344,373, Cl. 110-347.000.
Andres, Cletus N.: *See—*
Cline, Joseph S.; and Andres, Cletus N., 4,345,231, Cl. 336-192.000.
Angelo, James F., II. Apparatus for continuously carbonizing and activating carbonaceous materials. 4,344,821, Cl. 201-33.000.
Angstmann, Heinz-Dieter: *See—*
Kothe, Wilfried; and Angstmann, Heinz-Dieter, 4,344,764, Cl. 8-138.000.
Angus Motor Corporation: *See—*
Angus, Neil H., 4,345,174, Cl. 310-24.000.
Angus, Neil H., to Angus Motor Corporation. Electromagnetic engine. 4,345,174, Cl. 310-24.000.
Antonenkov, Igor K.: *See—*
Chachin, Viktor N.; Kolos, Vladimir K.; Botyan, Viktor V.; Luzgin, Vladimir I.; and Antonenkov, Igor K., 4,344,313, Cl. 72-453.100.
Antoniw, Walter W.: *See—*
Norton, James F.; Silagy, Richard J.; and Antoniw, Walter W., 4,344,455, Cl. 137-329.400.
Aoda, Yukio; Ninomiya, Hiroshi; Yoshida, Kooichi; and Koyanagi, Osamu, to Nippon Kayaku Kabushiki Kaisha. Pharmaceutical vehicle. 4,344,968, Cl. 424-365.000.
Aoki, Katsuhiko: *See—*
Komuro, Keigo; Yamada, Matsuichi; Aoki, Katsuhiko; Yoshikawa, Yoshihiko; Itoh, Fumio; Takeda, Fumio; and Ishida, Osami, 4,345,255, Cl. 343-100.0PE.
Aoki, Kozo: *See—*
Takahashi, Osamu; Ohki, Nobutaka; and Aoki, Kozo, 4,345,016, Cl 430-214.000.
Apezynski, Frederick A. Wheel trim retention. 4,344,654, Cl. 301-37.00R.
Aqua-Chem, Inc.: *See—*
Chronowski, Robert A., 4,344,372, Cl. 110-245.000.
Arakawa, Hiroshi: *See—*
Hasegawa, Junzo; Kawabata, Susumu; Yoshida, Kazunori; Suzuki, Fuzio; Itoh, Yusuke; Suzuki, Hajime; Arakawa, Hiroshi; and Kobayashi, Akira, 4,344,465, Cl. 139-435.000.
Arcamone, Federico: *See—*
Suarato, Antonino; Penco, Sergio; and Arcamone, Federico, 4,345,070, Cl. 536-17.00A.
Suarato, Antonio; Penco, Sergio; and Arcamone, Federico, 4,345,068, Cl. 536-17.00A.
Archenholtz, Ake; Caisander, Yngve; and Haas, Gustav, to ASEA Aktiebolag. Means for removing the lining of a crucible furnace. 4,344,652, Cl. 299-70.000.
Architectural Art Mfg., Inc.: *See—*
Thom, Wenzel W., 4,344,719, Cl. 403-297.000.
Arendt, Hans F.; and Hoffmann, Ernst H., to Hoesch Werke Aktiengesellschaft. Procedure for washing clothes. 4,344,198, Cl. 8-158.000.
Arendt, Henry P., to Otis Engineering Corporation. Lock open mechanism for subsurface safety valve. 4,344,602, Cl. 251-58.000.
Ark-Les Corporation: *See—*
Walkup, William B., 4,344,664, Cl. 339-99.00R.
Armco Inc.: *See—*
Haselkorn, Michael H., 4,344,802, Cl. 148-27.000.
Armstrong World Industries, Inc.: *See—*
Shelley, Donald L., 4,345,204, Cl. 324-61.00R.
Arndt, Friedrich: *See—*
Boroschewski, Gerhard; Nusslein, Ludwig; and Arndt, Friedrich, 4,344,790, Cl. 71-111.000.
Arnolds, Karlheinz E. H.: *See—*
MacPhee, John; Gasparrini, Charles R.; and Arnolds, Karlheinz E. H., 4,344,361, Cl. 101-425.000.
Arquie, Louis; Bricot, Claude; and Thirouard, Michel, to Thomson-CSF. Semiconductor laser source optical reading head. 4,345,321, Cl. 369-46.000.
Arulpragasam, Jega A.; Giggi, Robert A.; Lary, Richard F.; and Sullivan, Daniel T., to Digital Equipment Corporation. Relating to cached multiprocessor system with pipeline timing. 4,345,309, Cl. 364-200.000.
Asaba, Hirosi: *See—*
Fujita, Kenji; Korehisa, Kazuo; Asaba, Hirosi; Harada, Hideo; and Shibuya, Tsuneo, 4,344,204, Cl. 15-93.00A.
Asahi-Dow Limited: *See—*
Hoki, Tsuneo; and Matsuki, Yutaka, 4,345,041, Cl. 521-94.000.
Asahi Glass Company, Ltd.: *See—*
Yamabe, Masaaki; Kojima, Gen; and Kaya, Seitoku, 4,345,057, Cl. 526-247.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Iriguchi, Norio; Unno, Hiroshi; and Tsuda, Nobuaki, 4,344,560, Cl. 233-19.00A.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Kohmoto, Shinsuke; and Haneishi, Yasuyuki, 4,344,689, Cl. 354-286.000.
Asai, Tadamichi; and Nakamura, Kousuke, to Hitachi, Ltd. Resistor glass seal spark plug. 4,345,179, Cl. 313-136.000.
Asaida, Takashi: *See—*
Nagumo, Fumio; and Asaida, Takashi, 4,345,270, Cl. 358-44.000.
Asano, Masaharu, to Nissan Motor Co., Ltd. Control device for an internal combustion engine. 4,344,400, Cl. 123-425.000.
Asano, Shiro; Shizuka, Kohei; Kambara, Yoshihiko; Mikami, Junji; Kato, Hiroshi; and Honda, Tadatoshi, to Mitsui Toatsu Chemicals, Inc. Process for purifying an aqueous solution of acrylamide. 4,345,101, Cl. 564-206.000.
Aschberger, Anton A.; and Walter, John, to Continental Group, Inc., The. Pilferproof closure with mechanical interlock. 4,344,545, Cl. 220-307.000.
ASEA Aktiebolag: *See—*
Archenholtz, Ake; Caisander, Yngve; and Haas, Gustav, 4,344,652, Cl. 299-70.000.
Ash, Gerald R.; and Cardwell, Richard H., to Bell Telephone Laboratories, Incorporated. Dynamic, non-hierarchical arrangement for routing traffic. 4,345,116, Cl. 179-18.0EA.
Aso, Kinichi: *See—*
Nagasaki, Michisuke; and Aso, Kinichi, 4,344,337, Cl. 74-740.000.
Astrove, Edgar. Medication directing aid. 4,344,430, Cl. 128-233.000.
Ateliers des Charmilles, S.A.: *See—*
Semon, Georges; and Wavre, Alain, 4,345,131, Cl. 219-69.00G.
Atlantic Richfield Company: *See—*
Gaul, James M.; and Nguyen, Tinh, 4,344,798, Cl. 106-123.0LC.
Rowley, Paul R., 4,344,384, Cl. 119-4.000.
Taylor, Kenneth R., 4,344,718, Cl. 403-287.000.
Atlas Copco Aktiebolag: *See—*
Herron, Lorne R., 4,344,599, Cl. 248-660.000.
Aubert, Jean-Paul; and Genini, Maurice, to COFLEXIP. Flexible tubular conduit. 4,344,462, Cl. 138-130.000.
Aubin, Norbert T. Method and surgically implantable apparatus for providing fluid communication with the interior of the body. 4,344,435, Cl. 128-350.00R.
Auge, Wolfgang; Thelen, Bernd; Thiem, Karl-Werner; and Neeff, Rutger, to Bayer Aktiengesellschaft. Process for working up nitric acid. 4,344,827, Cl. 203-13.000.
Aultz, Daniel E.: *See—*
McFadden, Arthur R.; and Aultz, Daniel E., 4,345,087, Cl. 549-44.000.
Austin, John J., to Champion International Corporation. Expandable carton and blank for forming same. 4,344,537, Cl. 206-611.000.
Austin, Victor L. Fluid pipe guard device. 4,344,544, Cl. 220-86.0AT.
Autoipari Kutato Intezet: *See—*
Ratsko, Istvan; Ivony, Jozsef; Madi, Jeno; and Karasz, Gyorgy, 4,344,640, Cl. 280-432.000.
Automated Packaging Systems, Inc.: *See—*
Lerner, Bernard, 4,344,557, Cl. 229-53.000.
Automobiles Peugeot: *See—*
Etienne, Michel, 4,344,513, Cl. 192-.02R.
Automotive Engine Associates: *See—*
Showalter, Merle R., 4,344,394, Cl. 123-306.000.
Automotive Invention Researchers (Pty) Limited: *See—*
Nunes, Anizio G. R., 4,344,389, Cl. 123-25.00B.
Azuma, Kenkoku: *See—*
Matsuoka, Hiromasa; Azuma, Kenkoku; and Nishiyama, Enju, 4,344,778, Cl. 55-180.000.
B. F. Goodrich Company, The: *See—*
Hall, Dale R., 4,345,040, Cl. 521-53.000.
Kramer, James H., 4,344,806, Cl. 156-154.000.
Lindeen, Gale E., 4,344,236, Cl. 34-110.000.
Babcock, Barbara: *See—*
Ehrhardt, Horst, 4,344,446, Cl. 132-7.000.
Babson Bros. Co.: *See—*
Swanson, Harold V.; and Thompson, Duncan M., 4,344,385, Cl. 119-14.080.
Baginski, Richard M.: *See—*
Allaway, Philip N.; Baginski, Richard M.; Liu, Don K. K.; and Teixeira, Theodore M., 4,344,871, Cl. 252-531.000.

Bailey, Frank W., to Fuelsaver Company. Process and apparatus utilizing common structure for combustion, gas fixation, or waste heat recovery. 4,344,479, Cl. 165-109.00R.
Bainbridge, Augustus S., to United States of America, Army. Bias-compensated, ionization sensor for gaseous media and method for attaining proper bias for same. 4,345,154, Cl. 250-375.000.
Baker, David E., to E-A-R Corporation. Target with energy-absorbing foam mat. 4,344,621, Cl. 273-26.00A.
Baker Instruments Corp.: *See*—
Parker, Bernard; and Parsonnet, Brian, 4,344,768, Cl. 23-230.00R.
Baker International Corporation: *See*—
Longacre, Kenneth E.; and Kruschke, Marvin R., Sr., 4,344,651, Cl. 299-5.000.
Balch, Joseph C. Solar-earth thermal system. 4,344,414, Cl. 126-434.000.
Baldwin-Gegenheimer Corporation: *See*—
MacPhee, John; Gasparrini, Charles R.; and Arnolds, Karlheinz E. H., 4,344,361, Cl. 101-425.000.
Balistreri, Thomas W.: *See*—
Larkin, Mark E.; and Balistreri, Thomas W., 4,344,472, Cl. 150-8.000.
Balwe, Thomas: *See*—
Thyret, Helmut E.; Balwe, Thomas; Beier, Gerhard; and Bauer, Johann, 4,345,056, Cl. 526-200.000.
Bambara, Joseph E., to Servo Corporation of America. Object identification system utilizing closed circuit television. 4,345,274, Cl. 358-108.000.
Bamford, Charles R.; Mellor, James R.; and Parker, Bernard, to Pilkington Brothers Limited. Optical glass fibres and method of forming such fibres. 4,345,036, Cl. 501-37.000.
Bancroft, John; Greenhalgh, John L.; and Smith, Ronald, to J. H. Fenner & Co. Ltd. Scraper device. 4,344,525, Cl. 198-499.000.
Banks, Bruce A.; Mirtich, Michael J.; and Sovey, James S., to United States of America, National Aeronautics and Space Administration. Surface texturing of fluoropolymers. 4,344,996, Cl. 428-141.000.
Barabas, Udo; Moehrmann, Karl-Heinz; and Christiansen, Hans-Marlin, to Siemens Aktiengesellschaft. Broad band switching system. 4,345,273, Cl. 358-86.000.
Bareiss, Raoul. Apparatus for the fast, painless treatment of varicose ulcers. 4,344,421, Cl. 128-24.00R.
Barger, Danny R.; Eggert, Carl A.; and Lloyd, Paul O., to Bell & Howell Company. Driver for postage meters. 4,345,193, Cl. 318-612.000.
Barmby, Lucy L. Anti-eating face mask. 4,344,424, Cl. 128-136.000.
Barner, Roland K. Arrow rest apparatus. 4,344,409, Cl. 124-24.00R.
Barolin, Nestor E. Rocker arm and pin holder assembly for a lens surfacing machine. 4,344,259, Cl. 51-216.0LP.
Barrett, Richard B.: *See*—
Gilson, James J.; and Barrett, Richard B., 4,344,577, Cl. 239-546.000.
Bartley, Burton H.: *See*—
Petty, Randall H.; and Bartley, Burton H., 4,344,926, Cl. 423-244.000.
Bartz, Richard O.: *See*—
Child, Frances W.; and Bartz, Richard O., 4,344,403, Cl. 123-538.000.
Child, Francis W.; and Bartz, Richard O., 4,344,402, Cl. 123-538.000.
Child, Francis W.; and Bartz, Richard O., 4,344,404, Cl. 123-538.000.
Basey, Gene, to Zenith Stairways & Building Products, Inc. Variable rake stair rail assembly. 4,344,604, Cl. 256-65.000.
BASF Aktiengesellschaft: *See*—
Baumann, Hans; and Oberlinner, Andreas, 4,345,073, Cl. 544-70.000.
Blinne, Gerd; Naarmann, Herbert; and Penzien, Klaus, 4,344,869, Cl. 252-517.000.
Blinne, Gerd; Naarmann, Herbert; and Penzien, Klaus, 4,344,870, Cl. 252-517.000.
Dehnert, Johannes; and Juenemann, Werner, 4,344,880, Cl. 260-152.000.
Denzinger, Walter; Straub, Ferdinand; and Hartmann, Heinrich, 4,345,049, Cl. 525-339.000.
Horner, Michael; and Nissen, Axel, 4,344,886, Cl. 549-408.000.
Koenig, Karl-Heinz; Schwendemann, Volker; and Feuerherd, Karl-Heinz, 4,344,891, Cl. 260-453.00A.
Kothe, Wilfried; and Angstmann, Heinz-Dieter, 4,344,764, Cl. 8-138.000.
Ostertag, Werner; Bittler, Knut; and Bock, Gustav, 4,344,987, Cl. 427-213.000.
Schwarz, Gerd-Ulrich; Kiehs, Karl; and Adolphi, Heinrich, 4,344,961, Cl. 424-285.000.
Steck, Werner; Sarnecki, Wilhelm; Marosi, Laszlo; Ohlinger, Manfred; and Loeser, Werner, 4,344,791, Cl. 75-0.5AA.
Widder, Rudi; Getto, Elmar; and Hettche, Albert, 4,344,862, Cl. 252-391.000.
Basler Electric Company: *See*—
Cline, Joseph S.; and Andres, Cletus N., 4,345,231, Cl. 336-192.000.
Batty, Mark J.; and Groth, Thomas, to Letraset USA, Inc. Sign lettering materials. 4,344,994, Cl. 428-41.000.
Bauer, Johann: *See*—
Thyret, Helmut E.; Balwe, Thomas; Beier, Gerhard; and Bauer, Johann, 4,345,056, Cl. 526-200.000.
Bauman, Thomas G.; and Kast, Jack L., to Remington Arms Company, Inc. Firing pin block for firearm having a reciprocating breech bolt. 4,344,246, Cl. 42-69.00B.
Baumann, Hans; and Oberlinner, Andreas, to BASF Aktiengesellschaft. 7,7'-Diamino derivatives of 2,2'-spirodibenzopyranes. 4,345,073, Cl. 544-70.000.
Baxter Travenol Laboratories, Inc.: *See*—
Gupton, John E.; and Shim, Norman, 4,344,429, Cl. 128-214.00R.
Bayer Aktiengesellschaft: *See*—
Auge, Wolfgang; Thelen, Bernd; Thiem, Karl-Werner; and Neeff, Rutger, 4,344,827, Cl. 203-13.000.
Bonse, Gerhard; and Blank, Heinz U., 4,345,100, Cl. 564-124.000.
Fuchs, Rainer; Naumann, Klaus; Lantzsch, Reinhard; Hagemann, Hermann; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,344,960, Cl. 424-282.000.
Fuchs, Rainer; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,344,963, Cl. 424-304.000.
Goedecke, Ralf; Hofen, Willi; Seifert, Hermann; and Siekmann, Gerd, 4,344,897, Cl. 260-502.00R.
Haupt, Walter; Warncke, Heinz; Friebe, Heinz W.; and Reimold, Dieter, 4,344,320, Cl. 73-40.700.
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Hammann, Ingeborg; and Stendel, Wilhelm, 4,345,078, Cl. 544-244.000.
Kohler, Klaus; Woditsch, Peter; Rieck, Hilmar; and Rodi, Fritz, 4,344,799, Cl. 106-300.000.
Kuhle, Engelbert; Paulus, Wilfried; Genth, Hermann; and Brandes, Wilhelm, 4,344,962, Cl. 424-300.000.
Lahrs, Jurgen; Schubert, Klaus; Gosling, Claus; Jovcic, Dorde; Gleinig, Harald; and Skerhut, Reiner, 4,344,766, Cl. 8-524.000.
Naumann, Klaus; and Rauchschwalbe, Rudolf, 4,345,090, Cl. 560-124.000.
Niemers, Ekkehard; Konig, Hans-Bodo; Schrock, Wilfried; and Metzger, Karl G., 4,344,939, Cl. 424-226.000.
Niemers, Ekkehard; Konig, Hans-Bodo; Schrock, Wilfried; and Metzger, Karl G., 4,344,955, Cl. 424-271.000.
Schafer, Walter; Wagner, Kuno; and Block, Hans-Dieter, 4,344,855, Cl. 252-182.000.
Stetter, Jorg; Homeyer, Bernhard; and Hammann, Ingeborg, 4,344,953, Cl. 424-269.000.
BBC Brown, Boveri & Company, Ltd.: *See*—
Curiel, Georg; and Naguib, Moustafa M., 4,344,289, Cl. 60-612.000.
Czech, Franz; Mauthe, Gerhard; and Pfrotzschner, Hans, 4,345,129, Cl. 200-163.000.
Niemeyer, Lutz, 4,345,127, Cl. 200-148.00R.
Beaird, Suzanne M. T.: *See*—
Nickles, Stephen K.; and Beaird, Suzanne M. T., 4,344,364, Cl. 105-62.00R.
Beals, Jeffrey R.: *See*—
Yates, Patrick; Woodcock, Sydney H.; and Beals, Jeffrey R., 4,344,352, Cl. 89-198.000.
Becher, Heinz-Manfred, to Celamerck GmbH & Co. KG. Process for recovery of benzene and chlorine from waste products. 4,344,829, Cl. 204-72.000.
Becker, Jon; Miller, G. Kirby; and Burney, Charles F., to GTE Products Corporation. Apparatus for making tape transducer. 4,344,810, Cl. 156-379.700.
Beckman Instruments, Inc.: *See*—
Louderback, Allan L.; and Foley, Thomas J., 4,344,864, Cl. 252-408.000.
Bedard, James F.; Eichelberger, Charles W.; and Nati, Salvatore F., Jr., to General Electric Company. Load output level control circuit. 4,345,200, Cl. 323-350.000.
Begeman, Robert H.; Sanderson, Barry D.; Weiss, Donald C.; and Zeph, David L., to United States of America, Navy. Solid state commutator switch. 4,345,251, Cl. 340-825.860.
Behrenz, Wolfgang: *See*—
Fuchs, Rainer; Naumann, Klaus; Lantzsch, Reinhard; Hagemann, Hermann; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,344,960, Cl. 424-282.000.
Behringwerke Aktiengesellschaft: *See*—
Sedlacek, Hans-Herald; and Seiler, Friedrich R., 4,344,938, Cl. 424-177.000.
Beier, Gerhard: *See*—
Thyret, Helmut E.; Balwe, Thomas; Beier, Gerhard; and Bauer, Johann, 4,345,056, Cl. 526-200.000.
Bell & Howell Company: *See*—
Barger, Danny R.; Eggert, Carl A.; and Lloyd, Paul O., 4,345,193, Cl. 318-612.000.
Orsinger, Winston A.; and Fallos, George, 4,344,729, Cl. 414-226.000.
Bell, John T.: *See*—
May, Kenneth D.; and Bell, John T., 4,344,523, Cl. 198-424.000.
Bell Telephone Laboratories, Incorporated: *See*—
Ash, Gerald R.; and Cardwell, Richard H., 4,345,116, Cl. 179-18.0EA.
Bobeck, Andrew H., 4,345,317, Cl. 365-9.000.
Bulger, Gary A.; Heck, Lyle D.; Huttemann, Robert D.; Morabito, Joseph M.; Pitetti, Raymond C.; Unger, Burton A.; and Vallere, Donald J., 4,344,223, Cl. 29-577.00C.
Craighead, Harold G.; Howard, Richard E.; and Tennant, Donald M., 4,344,816, Cl. 156-643.000.
Davis, James A.; MacPherson, William F.; Mussman, Harry E.; and Shackle, Peter W., 4,345,163, Cl. 307-252.00A.
Sampson, George P., III, 4,345,170, Cl. 307-443.000.
Bemalux Inc.: *See*—
Blais, Jules M., 4,344,722, Cl. 405-270.000.

Bendix Corporation, The: *See*—
Johannesen, Donald D.; and Kazmierzak, Andrew F., 4,344,510, Cl. 188-71.900.
Schuster, Robert W.; and Mittendorf, Gerald C., 4,344,281, Cl. 60-39.28R.
Woo, Ji Y., 4,344,512, Cl. 188-79.5GE.

Benner, Harold T., Jr.: *See*—
Dieterlen, Paul E.; and Benner, Harold T., Jr., 4,344,269, Cl. 53-459.000.

Bennett, David S.; and Hoath, Grantley R., to Molins Limited. Apparatus for conveying rod-like articles. 4,344,521, Cl. 198-404.000.

Berg, Christoph: *See*—
Knothe, Erich; Berg, Christoph; and Melcher, Franz-Josef, 4,344,494, Cl. 177-210.00R.

Bergeron, David L.; and Smith, Paul H., to International Business Machines Corporation. Bipolar compatible electrically alterable read-only memory. 4,344,222, Cl. 29-571.000.

Bergquist, Frank H., to Harper-Wyman Company. Safety latch control arrangement for self-cleaning oven. 4,345,144, Cl. 219-413.000.

Berman, Herbert M.; and Hooper, Ira. Long span structural frame. 4,344,262, Cl. 52-227.000.

Berman, Joel. Insulated shade. 4,344,474, Cl. 160-121.00R.

Bernardini, Vincenzo; Garetti, Enzo; and Manfreddi, Renato, to CSELT-Centro Studi e Laboratori Telecomunicazioni S.p.A. Self-correcting, solid-state-mass-memory organized by bits and with reconfiguration capability for a stored program control system. 4,345,319, Cl. 365-210.000.

Berner, Godwin, to Ciba-Geigy Corporation. Stabilization of acid catalyzed stoving lacquers. 4,344,876, Cl. 524-91.000.

Berney, Jean-Claude, to Jean-Claude Berney SA. Integrated circuit for a time-piece. 4,345,320, Cl. 368-87.000.

Bernstein, Jack; Varma, Ravi K.; Vogt, B. Richard; and Weisenborn, Frank L., to E. R. Squibb & Sons, Inc. Steroid derivatives and their use in radioimmunoassays. 4,345,096, Cl. 562-465.000.

Bertrand, Richard D.; Chingas, Gerard C.; Garroway, Allen N.; and Moniz, William B., to United States of America, Navy. Method and apparatus for obtaining enhanced NMR signals. 4,345,207, Cl. 324-308.000.

Bessman, Samuel P.; and Thomas, Lyell J., Jr. Piezoelectric driven diaphragm micro-pump. 4,344,743, Cl. 417-317.000.

Bethlehem Steel Corporation: *See*—
Gerdes, John H., Jr., 4,344,819, Cl. 201-1.000.
Kihlstrom, Ernest H., 4,344,232, Cl. 33-143.00L.
Schwartz, S. Robert; Swan, William E., Jr.; Fetterman, Robert C.; and Neubaum, Victor A., deceased, 4,344,822, Cl. 201-39.000.
Smith, Marvin O., Jr., 4,344,607, Cl. 266-198.000.

Betz, Jacob F.: *See*—
Fulop, Gabor F.; Betz, Jacob F.; Meyers, Peter V.; and Doty, Mitchell E., 4,345,107, Cl. 136-255.000.

Beune, Joannes H.; and Marissen, Roelof H., to Wavin B.V. Pipe part with socket provided with longitudinally extending channels. 4,344,461, Cl. 138-109.000.

Bhatia, Chandrakant; Toman, George M.; and Bock, Thomas J., to Union Special Corp. Mechanism generating elliptical motion. 4,344,376, Cl. 112-200.000.

Biemiller, John E. Ice cube forming tray for ice making machine. 4,344,298, Cl. 62-347.000.

Biggs, Candice B.: *See*—
Wovcha, Merle G.; and Biggs, Candice B., 4,345,029, Cl. 435-55.000.
Wovcha, Merle G.; and Biggs, Candice B., 4,345,030, Cl. 435-55.000.
Wovcha, Merle G.; Biggs, Candice B.; and Pyke, Thomas R., 4,345,033, Cl. 435-253.000.

Bijen, Jan M. J. M.; and Jansen, Johann J., to Stamicarbon B.V. Process and apparatus for the manufacture of fiber-reinforced hydraulically bound articles such as cementitious articles. 4,344,804, Cl. 156-42.000.

Bijen, Jan M. J. M., to Stamicarbon, B.V. Process for the manufacture of water-hardening material. 4,344,910, Cl. 264-257.000.

Bijen, Jan M. J. M., to Stamicarbon, B.V. Process for the manufacture of water-hardening material reinforced with open meshed films. 4,345,001, Cl. 428-286.000.

Binderup, Ernst T., to Leo Pharmaceutical Products, Ltd. A/S. Derivatives of penicillanic acid. 4,345,071, Cl. 542-420.000.

Birgmeir, Klaus; and Stadler, Klaus, to Agfa-Gevaert Aktiengesellschaft. Opto-mechanical device to control the direction of beams of visible light. 4,344,666, Cl. 350-6.900.

Bittler, Dieter: *See*—
Wiechert, Rudolf; Bittler, Dieter; Schleusener, Annerose; and Albring, Manfred, 4,344,941, Cl. 424-243.000.

Bittler, Knut: *See*—
Ostertag, Werner; Bittler, Knut; and Bock, Gustav, 4,344,987, Cl. 427-213.000.

Bjurman, Susan: *See*—
Ehrhardt, Horst, 4,344,446, Cl. 132-7.000.

Black Copy Company, Inc.: *See*—
Diamond, Arthur S.; and Floersheim, Sydney N., 4,345,013, Cl. 430-106.600.

Black & Decker Inc.: *See*—
Jobling, Alan V.; and Crisp, David J., 4,344,273, Cl. 56-16.700.

Black, Robert B. Heat transfer equipment and method. 4,344,386, Cl. 122-19.000.

Bladh, Per, to Alfa-Laval AB. Process for recovering meal and oil from raw fish. 4,344,976, Cl. 426-472.000.

Blagaila, John H.; and Hopper, James F., to Storage Technology Corporation. Address mark detection circuit. 4,345,280, Cl. 360-49.000.

Blais, Jules M., to Bemalux Inc. Waterproofing barrier. 4,344,722, Cl. 405-270.000.

Blake, Anthony A.; and Blake, Neil W. Method for curing and smoking pork skins to condition them for rendering. 4,344,973, Cl. 426-264.000.

Blake, Joseph W., III. Disposable safety razor. 4,344,226, Cl. 30-31.000.

Blake, Neil W.: *See*—
Blake, Anthony A.; and Blake, Neil W., 4,344,973, Cl. 426-264.000.

Blanchard, Richard A., to Supertex, Inc. MOS Power transistor with improved high-voltage capability. 4,345,265, Cl. 357-23.000.

Blandamura, Manlio, to Finchimica S.R.L. Pharmacological use of cyproterone acetate. 4,344,942, Cl. 424-243.000.

Blank, Heinz U.: *See*—
Bonse, Gerhard; and Blank, Heinz U., 4,345,100, Cl. 564-124.000.

Blankenship, Michael G., to Corning Glass Works. Optical waveguide soot preform with reduced inner layer stress and method of making. 4,344,670, Cl. 350-96.310.

Blaser, Anton J. Disc-shaped centering fixture for optical encoders. 4,345,149, Cl. 250-231.05E.

Blazey, Richard N.: *See*—
Stuermer, Paul A.; and Blazey, Richard N., 4,344,677, Cl. 354-5.000.

Bleiweiss, Arthur F.; Cotoara, Dimitru; and Wilkes, Robert J., to Dominion Auto Accessories Limited. Truck mirror with overlying bottom end cover. 4,344,672, Cl. 350-288.000.

Blinne, Gerd; Naarmann, Herbert; and Penzien, Klaus, to BASF Aktiengesellschaft. Preparation of electrically conductive hetero-polyphenylenes. 4,344,869, Cl. 252-517.000.

Blinne, Gerd; Naarmann, Herbert; and Penzien, Klaus, to BASF Aktiengesellschaft. Preparation of electrically conductive hetero-polyaromatics. 4,344,870, Cl. 252-517.000.

Bliss, Richard D.: *See*—
Shaffer, Steven D.; Kienitz, L. Michael; Pitts, James N., Jr.; and Bliss, Richard D., 4,344,712, Cl. 366-108.000.

Block, Hans-Dieter: *See*—
Schafer, Walter; Wagner, Kuno; and Block, Hans-Dieter, 4,344,855, Cl. 252-182.000.

Boardman, Franklin: *See*—
Evans, Anthony; Lesniak. John M.; and Boardman, Franklin, 4,344,423, Cl. 128-90.000.

Bobeck, Andrew H., to Bell Telephone Laboratories, Incorporated. Magnetic domain memory with Hall effect detector. 4,345,317, Cl. 365-9.000.

Bock, Gustav: *See*—
Ostertag, Werner; Bittler, Knut; and Bock, Gustav, 4,344,987, Cl. 427-213.000.

Bock, Thomas J.: *See*—
Bhatia, Chandrakant; Toman, George M.; and Bock, Thomas J., 4,344,376, Cl. 112-200.000.

Boehringer Ingelheim GmbH: *See*—
Cullen, Ernest; Possanza, Genus; and Stewart, Patrick B., 4,344,946, Cl. 424-250.000.

Boeing Company, The: *See*—
Adamski, John L., 4,345,182, Cl. 313-348.000.
Hammer, Robert H., 4,344,995, Cl. 428-61.000.
Takats, Imre J.; and Chenoweth, Charles C., 4,345,191, Cl. 318-564.000.

Boiten, Ebbe: *See*—
Haes, Freddy; Reynhout, Cornelis M.; Hermes, Guillaume M. P. G.; and Boiten, Ebbe, 4,344,228, Cl. 30-43.900.

Bolich, Raymond E., Jr., to Procter & Gamble Company, The. Pyridinethione salts and hair care compositions. 4,345,080, Cl. 546-6.000.

Bolssens, Frans P. J.; Franck, Guy C. J. L. G. G. M.; and Dehertefelt, Henri, to International Standard Electric Corporation. Valve and a wire cutting, skinning and wrapping tool employing the valve. 4,344,212, Cl. 29-33.00F.

Bom, Cornelis J. G.: *See*—
van der Lely, Ary; Bom, Cornelis J. G.; and Kuipers, Arie, 4,344,499, Cl. 180-197.000.

Bonaparte, Al. Aerial forest fire extinguishing device. 4,344,489, Cl. 169-70.000.

Bonazza, Benedict R.; and DeVault, Albert N., to Phillips Petroleum Company. Fuel and lubricant additives from acid treated mixtures of vegetable oil derived amides and esters. 4,344,771, Cl. 44-63.000.

Bond, Harold U., to Kockums Industries Limited. Resilient positioning apparatus. 4,344,609, Cl. 269-27.000.

Bondina Ltd.: *See*—
Thornton, Alan; and Uttley, John S., 4,344,989, Cl. 427-286.000.

Bonse, Gerhard; and Blank, Heinz U., to Bayer Aktiengesellschaft. Preparation of α-ketocarboxylic acid N-tert.-butylamides. 4,345,100, Cl. 564-124.000.

Bonsen, Pieter; Wong, Patrick S.; and Theeuwes, Felix, to ALZA Corporation. Method of delivering drug with aid of effervescent activity generated in environment of use. 4,344,929, Cl. 424-15.000.

Boose, James R.: *See*—
Falck, Glenn H.; and Boose, James R., 4,344,524, Cl. 198-494.000.

Boots Company Limited, The: *See*—
Copping, Leonard G.; Kerry, John C.; Watkins, Thomas I.; Willis, Robert J.; and Palmer, Bryan H., 4,344,893, Cl. 260-456.00A.

Borden, Inc.: *See*—
Columbus, Peter S.; and Anderson, John, 4,345,044, Cl. 523-220.000.

Borel, Denis, to SRO Kugellagerwerke J. Schmid-Roost AG. Axial/rotary guide element. 4,344,657, Cl. 308-6.00C.

Boriack, Clinton J.: *See*—
Friedli, Hans R.; and Boriack, Clinton J., 4,345,048, Cl. 525-192.000.

Boroschewski, Gerhard; Nusslein, Ludwig; and Arndt, Friedrich, to Schering AG. Carbaminic acid esters with herbicidal properties. 4,344,790, Cl. 71-111.000.

Borror, Alan L.; and Greenwald, Richard B., to Polaroid Corporation. Sulfonyl-cyano alkane silver halide solvents. 4,345,018, Cl. 430-234.000.

Bottum, Edward W. Solar collector. 4,344,415, Cl. 126-434.000.

Botyan, Viktor V.: *See*—
Chachin, Viktor N.; Kolos, Vladimir K.; Botyan, Viktor V.; Luzgin, Vladimir I.; and Antonenkov, Igor K., 4,344,313, Cl. 72-453.100.

Bouge, Gilbert: *See*—
Dupin, Thierry; Bouge, Gilbert; and Seigneurin, Laurent, 4,344,928, Cl. 423-626.000.

Bour, Edmond H. J. P.; Brouwers, Johannes A. L.; and Warnier, Jean M. M., to Stamicarbon B.V. Method for polymerizing pyrrolidone with preheating of catalyst solution. 4,345,065, Cl. 528-312.000.

Bouwhuis, Richard W.: *See*—
Echols, James M.; and Bouwhuis, Richard W., 4,344,728, Cl. 414-39.000.

Bouzianis, George J.; Hollick, John G.; McIlvin, Donald B.; and Sillars, Frederick S., to USM Corporation. Machine for stiffening sheet material. 4,344,199, Cl. 12-54.300.

Boyer, Robert C.; and Williams, George J., to Ecolaire Incorporated. Support for heat exchange tubes. 4,344,480, Cl. 165-162.000.

Boyle, John F.; Halper, Barry J.; Link, James C.; and Mullane, John C., Jr., to Air Products and Chemicals, Inc. Process and apparatus for in-line slush making for concrete cooling. 4,344,290, Cl. 62-48.000.

Brabbs, William J.: *See*—
Youngquist, Rudolph W.; and Brabbs, William J., 4,344,969, Cl. 426-18.000.

Brandes, Wilhelm: *See*—
Kuhle, Engelbert; Paulus, Wilfried; Genth, Hermann; and Brandes, Wilhelm, 4,344,962, Cl. 424-300.000.

Breault, Richard D., to United Technologies Corporation. Apparatus for reducing electrolyte loss from an electrochemical cell. 4,345,008, Cl. 429-26.000.

Breitling, Wolfram, to Robert Bosch GmbH. Device for controlling the current through an inductive consumer, especially a magnetic valve in the fuel metering system of an internal combustion engine. 4,345,296, Cl. 361-154.000.

Bresak, Ann F.: *See*—
Tolgyesi, Eva; and Bresak, Ann F., 4,344,763, Cl. 8-127.510.

Breunig, Roger D.: *See*—
Kelly, Wallace N.; and Breunig, Roger D., 4,344,738, Cl. 416-95.000.

Brewing Research Foundation, The: *See*—
Sharpe, Frederick R.; Grimmett, Christopher M.; and Laws, Derek R. J., 4,344,978, Cl. 426-600.000.

Bricot, Claude: *See*—
Arquie, Louis; Bricot, Claude; and Thirouard, Michel, 4,345,321, Cl. 369-46.000.

British Aerospace: *See*—
Holmes, Frederick H., 4,344,305, Cl. 464-169.000.

British Broadcasting Corporation: *See*—
Clarke, Christopher K. P., 4,345,268, Cl. 358-31.000.

British Petroleum Company Limited, The: *See*—
Chesters, David A., 4,344,751, Cl. 431-202.000.

Brittain, Darryl A.: *See*—
Anderson, Paul L.; and Brittain, Darryl A., 4,344,966, Cl. 424-343.000.

Broersma, Robert J., Jr.; and Spittka, Gayle A., to Dow Chemical Company, The. Method of inhibiting sickling of sickle erythrocytes using substituted-2-imidazolines. 4,344,958, Cl. 424-273.00R.

Brois, Stanley J.: *See*—
Gutierrez, Antonio; Brois, Stanley J.; Ryer, Jack; and Deen, Harold E., 4,344,853, Cl. 252-33.600.

Brooks, Kevin E.: *See*—
Wovcha, Merle G.; and Brooks, Kevin E., 4,345,034, Cl. 435-253.000.

Brooks & Perkins, Incorporated: *See*—
Naffa, Faisal A., 4,344,726, Cl. 410-79.000.

Brophy, Hugh J., Jr.: *See*—
Brophy, Hugh J., Sr.; and Brophy, Hugh J., Jr., 4,344,248, Cl. 43-15.000.

Brophy, Hugh J., Sr.; and Brophy, Hugh J., Jr. Automatic hooksetting fishing rod holder. 4,344,248, Cl. 43-15.000.

Brouwers, Johannes A. L.: *See*—
Bour, Edmond H. J. P.; Brouwers, Johannes A. L.; and Warnier, Jean M. M., 4,345,065, Cl. 528-312.000.

Brown, Gregory J., to FMC Corporation. Liquid transfer apparatus. 4,344,469, Cl. 141-90.000.

Brugmans, Johannes T.: *See*—
de Leeuw, Johannes A. N.; and Brugmans, Johannes T., 4,344,998, Cl. 428-212.000.

Brun, Norbert: *See*—
Gerard, Roland; Brun, Norbert; and Ricard, Jacques, 4,345,303, Cl. 362-80.000.

Brunelle, Daniel J., to General Electric Company. Polycarbonate transesterification with tetraborate or tetraaluminate anion containing catalyst. 4,345,062, Cl. 528-198.000.

Brunner, Anton, to Siemens Aktiengesellschaft. Primary radar antenna having a secondary radar (IFF) antenna integrated therewith. 4,345,257, Cl. 343-780.000.

Brunswick Corporation: *See*—
Puryear, John W., 4,344,586, Cl. 242-84.50A.

Bucher, Robert R.; and Riner, Felix, to Textilma AG. Thread control means in a textile machine. 4,344,307, Cl. 66-84.00R.

Budecker, Ludwig; and Schutt, Bernd, to ITT Industries, Inc. Pressure responsive distributing valve device. 4,344,451, Cl. 137-101.000.

Bulger, Gary A.; Heck, Lyle D.; Huttemann, Robert D.; Morabito, Joseph M.; Pitetti, Raymond C.; Unger, Burton A.; and Vallere, Donald J., to Western Electric Company, Inc.; and Bell Telephone Laboratories, Incorporated. Monolithic hybrid integrated circuits. 4,344,223, Cl. 29-577.00C.

Bunge, Konrad: *See*—
Thurm, Siegfried; and Bunge, Konrad, 4,344,704, Cl. 355-77.000.

Bunn, Billy A.: *See*—
Higgins, Frank; Lautenshlager, Gilbert G.; and Bunn, Billy A., 4,344,781, Cl. 55-379.000.

Burgin, Kermit. Acrylooptic tongue depressor and handle therefor. 4,344,419, Cl. 128-18.000.

Burke, Oliver W., Jr., to Exxon Research and Engineering Company. Homogenizing system for producing high polymer latices. 4,344,859, Cl. 252-359.00D.

Burkett, Ronald J.; and Dunn, Luther L., to Linden Chemicals & Plastics, Inc. Mercury removal process and apparatus. 4,344,793, Cl. 75-81.000.

Burney, Charles F.: *See*—
Becker, Jon; Miller, G. Kirby; and Burney, Charles F., 4,344,810, Cl. 156-379.700.

Burroughs Corporation: *See*—
DeMoss, Dean; and Richardson, Harvey J., 4,345,285, Cl. 360-133.000.
Greer, Douglas S.; and Grunewald, Paul, 4,345,244, Cl. 340-728.000.
Leise, Walter F.; and Darcy, John J., 4,344,612, Cl. 271-162.000.

Butler, Roger M., to Exxon Production Research Company. Method for continuously producing viscous hydrocarbons by gravity drainage while injecting heated fluids. 4,344,485, Cl. 166-271.000.

Buttner, Horace J.; and Buttner, Thomas E. Electrical contact positioning assembly. 4,345,128, Cl. 200-153.00J.

Buttner, Thomas E.: *See*—
Buttner, Horace J.; and Buttner, Thomas E., 4,345,128, Cl. 200-153.00J.

C.G.R. MeV: *See*—
Tran, Duc T., 4,345,210, Cl. 328-234.000.

C. H. Boehringer Sohn: *See*—
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Muacevic, Gojko; and Traunecker, Werner, 4,344,964, Cl. 424-304.000.

C.P. Chemical Co., Inc.: *See*—
Hasselman, Walter, Jr., 4,345,061, Cl. 528-161.000.

C. Van der Lely N.V.: *See*—
van der Lely, Ary, 4,344,490, Cl. 172-253.000.
van der Lely, Ary; Bom, Cornelis J. G.; and Kuipers, Arie, 4,344,499, Cl. 180-197.000.

Cadotte, Ernest R.; and Hester, Gerald P., to MSI Data Corporation, by said Gerald P. Hester. Customer satisfaction terminal. 4,345,315, Cl. 364-900.000.

Cagnazzi, Ernesto, to Meka S.N.C. di P. Merati & C. Pocket accessory for oral hygiene. 4,344,535, Cl. 206-581.000.

Caisander, Yngve: *See*—
Archenholtz, Ake; Caisander, Yngve; and Haas, Gustav, 4,344,652, Cl. 299-70.000.

Calvin, Noel M. Capacitance proximity sensor. 4,345,167, Cl. 307-308.000.

Campbell Soup Company: *See*—
Salmonsen, Andrew R.; and Feehery, William J., Jr., 4,344,493, Cl. 177-52.000.

Canadian General Electric Company Limited: *See*—
Eastcott, Peter deH.; Truman, Peter T.; and Scuccato, Serge L., 4,345,123, Cl. 200-52.00R.

Canadian Patents & Development Ltd.: *See*—
Lucas, Bernard H.; and Ritcey, Gordon M., 4,344,924, Cl. 423-54.000.
Nasser, Karim W., 4,344,316, Cl. 73-19.000.

Canfield, Sheldon A.; and Sanik, Paul S., to Owens-Corning Fiberglas Corporation. Method of and apparatus for detecting the level of molten glass in a glass melting furnace. 4,345,106, Cl. 373-27.000.

Canon Kabushiki Kaisha: *See*—
Kasama, Nobuhiro; and Kitajima, Tadayuki, 4,344,700, Cl. 355-3.0SC.
Sekiguchi, Takeshi, 4,345,271, Cl. 358-55.000.
Shirato, Yoshiaki; Takatori, Yasushi; Hara, Toshitami; Nishimura, Yukuo; and Takahashi, Michiko, 4,345,262, Cl. 346-140.00R.
Tazaki, Shigemitsu; and Kyogoku, Hiroshi, 4,345,263, Cl. 346-140.00R.

Canto, Gabriel F. Support for horizontal pipe or the like. 4,344,593, Cl. 248-73.000.

Capener, Erwin L.; and Low, James M., to Wilwardco, Inc. Method and apparatus for converting solid organic material to fuel oil and gas. 4,344,770, Cl. 44-50.000.

Cardwell, Richard H.: *See*—
Ash, Gerald R.; and Cardwell, Richard H., 4,345,116, Cl. 179-18.0EA.

Carl Dunmon & Associates, Inc.: *See*—
Sukolics, Ronald D., 4,344,267, Cl. 52-762.000.

Carl Still GmbH & Co. KG., Firma: *See*—
Stratmann, Josef; and Mrongowius, Klaus, 4,344,823, Cl. 201-41.000.

Carlson, Charles H. Controlled friction exercising device. 4,344,615, Cl. 272-67.000.

Carney, James E., to Caterpillar Tractor Co. Body positioning and driving apparatus. 4,344,811, Cl. 156-397.000.

Caroli, Celso. Tap and mixer for the delivery of water. 4,344,457, Cl. 137-597.000.

Carre, Roland; and Doriath, Georges, to Thomson-CSF. Non-linear dynamic filtering device for the angular measuring of noise in a radar. 4,345,252, Cl. 343-5.0NQ.

Carriere, Donald L., to Ford Motor Company. Differential traction drive with extreme overall torque ratios for use in a gas turbine engine driveline. 4,344,336, Cl. 74-690.000.

Casio Computer Co., Ltd.: *See*—
Sano, Shigenori, 4,344,345, Cl. 84-1.030.

Casper, Clarence, Jr., to Moniterm Corporation. High resolution, high density CRT monitor. 4,345,187, Cl. 315-408.000.

Cassella Aktiengesellschaft: *See*—
Hufnagel, Theobald; and Hetschko, Manfred, 4,345,074, Cl. 544-99.000.

Casterton, Robert H.; Phippen, Larry J.; and Wright, Darrell L., to Deere & Company. Air distribution system. 4,344,356, Cl. 98-2.110.

Caterpillar Tractor Co.: *See*—
Carney, James E., 4,344,811, Cl. 156-397.000.
Richardson, Ronald D., 4,344,323, Cl. 73-119.00A.
Sindelar, Ernest C., 4,344,287, Cl. 60-572.000.

Caumont, Jean-Francois, to Tempo Sanys. Sterilizable surgical pad. 4,344,426, Cl. 128-156.000.

Cazarra, Victor; Schwab, Andre; and Zunino, Patrick, to International Business Machines Corporation. Method for characterizing the oxygen contents of Czochralski grown silicon rods. 4,344,815, Cl. 156-601.000.

Cedar, Charles E.: *See*—
Petaja, Glen E.; and Cedar, Charles E., 4,344,478, Cl. 165-69.000.

Celamerck GmbH & Co. KG: *See*—
Becher, Heinz-Manfred, 4,344,829, Cl. 204-72.000.

Celanese Corporation: *See*—
Pilat, Howard L.; Moore, Jerry D.; and Chosnek, Jack, 4,345,093, Cl. 560-205.000.

Ceres Electronics Corporation: *See*—
Moxon, Edwin C.; and Menashi, Wilson P., 4,344,315, Cl. 374-44.000.

Cessna Aircraft Company, The: *See*—
Ridge, William A., 4,344,285, Cl. 60-452.000.

CGEE Alsthom: *See*—
Debaigt, Jean, 4,345,226, Cl. 335-166.000.

Chachin, Viktor N.; Kolos, Vladimir K.; Botyan, Viktor V.; Luzgin, Vladimir I.; and Antonenkov, Igor K. Hydropunch for use in a press. 4,344,313, Cl. 72-453.100.

Chalmers, Alexander A.: *See*—
Wollam, Carl A.; Gailey, J. Lynn; and Chalmers, Alexander A., 4,344,990, Cl. 427-286.000.

Chaloupka, Premysl G., to St. Regis Paper Company. Method and apparatus for stacking and collating articles. 4,344,727, Cl. 414-36.000.

Chamberlin, Rhodes R., to Photon Power, Inc. Process for forming tin oxide conductive pattern. 4,344,817, Cl. 156-645.000.

Champion International Corporation: *See*—
Austin, John J., 4,344,537, Cl. 206-611.000.
McLaren, Edwin C., 4,344,814, Cl. 156-581.000.

Chan, John C. H., to Houston Systems Manufacturing Co., Inc. Valve bonnet for high temperature service. 4,344,454, Cl. 137-315.000.

Chan, Ka-Kong; Holland, George W.; and Rosen, Perry, to Hoffmann-La Roche Inc. Unsaturated eicosanoic acids. 4,345,084, Cl. 548-237.000.

Chang, Clarence D.; and Lang, William H., to Mobil Oil Corporation. Catalyst for synthesis gas conversion to oxygenates. 4,344,868, Cl. 252-455.00Z.

Chang, Paul S., to AMP Incorporated. Pulse duration digital multiplexing system. 4,345,323, Cl. 370-9.000.

Charbonnages de France: *See*—
Puff, Roger M.; and Kita, Jean-Claude, 4,344,769, Cl. 44-23.000.

Charton, Wayne F.: *See*—
Gangluff, Joseph A.; and Charton, Wayne F., 4,344,374, Cl. 111-2.000.

Chass, Jacob, to Pickering & Company, Inc. Multiple rotary variable differential transformer on common shaft with leakage flux compensation. 4,345,230, Cl. 336-135.000.

Check, Alex J. Electronic static discharge apparatus. 4,345,297, Cl. 361-215.000.

Chemie Linz Aktiengesellschaft: *See*—
Siegl, Annemarie; Knopp, Christian; and Reithmayr, Karl, 4,344,933, Cl. 424-79.000.

Chemische Werke Huls AG: *See*—
Mumcu, Salih; and Panoch, Hans J., 4,345,052, Cl. 525-411.000.
Mumcu, Salih, 4,345,064, Cl. 528-288.000.
Ruter, Jorn, 4,345,066, Cl. 528-324.000.

Chen, Albert C., to Mobil Oil Corporation. Carbonate-acrylate or alkylacrylate radiation curable coating compositions and method of curing. 4,344,982, Cl. 427-44.000.

Chen, Evan N.; Emmett, James S.; Ferraro, Frank A.; and Peleckis, Anthony J., to Warner-Lambert Company. Clean-out mechanism for twin blade shaving unit. 4,344,227, Cl. 30-41.000.

Chenoweth, Charles C.: *See*—
Takats, Imre J.; and Chenoweth, Charles C., 4,345,191, Cl. 318-564.000.

Cherney, Jerome A.; and Pawlowski, Thomas D., to American Can Company. Partially shielded microwave carton. 4,345,133, Cl. 219-10.55E.

Cherry, Sidney J.; and Wayland, Paul O., to Westinghouse Electric Corp. Vacuum interrupter with transfer-type axial magnetic field contacts. 4,345,126, Cl. 200-144.00B.

Chesters, David A., to British Petroleum Company Limited, The. Flares. 4,344,751, Cl. 431-202.000.

Chevron Research Company: *See*—
Kurkov, Victor P., 4,344,896, Cl. 260-465.100.

Chief Industries, Inc.: *See*—
Aldrich, Roger B.; and White, Gary R., 4,344,314, Cl. 72-461.000.

Chien-Chun, Yu. Fuseless safety magnetic plug. 4,345,223, Cl. 335-6.000.

Chierici, Osvaldo F., to Holland Company. Coupler carrier arrangement for railroad cars. 4,344,541, Cl. 213-61.000.

Chikamura, Takao: *See*—
Ogawa, Kazufumi; Chikamura, Takao; and Shibata, Takuo, 4,345,021, Cl. 430-321.000.

Chilcot, Arthur L., to Ferranti Limited. Gas lasers. 4,344,905, Cl. 264-111.000.

Child, Frances W.; and Bartz, Richard O. Fuel supply system. 4,344,403, Cl. 123-538.000.

Child, Francis W.; and Bartz, Richard O. Fuel supply system. 4,344,402, Cl. 123-538.000.

Child, Francis W.; and Bartz, Richard O. Fuel supply system. 4,344,404, Cl. 123-538.000.

Children's Hospital Medical Center, The: *See*—
Lew, Kenneth K., 4,345,026, Cl. 435-4.000.

Chingas, Gerard C.: *See*—
Bertrand, Richard D.; Chingas, Gerard C.; Garroway, Allen N.; and Moniz, William B., 4,345,207, Cl. 324-308.000.

Chosnek, Jack: *See*—
Pilat, Howard L.; Moore, Jerry D.; and Chosnek, Jack, 4,345,093, Cl. 560-205.000.

Chow, Wing-Sun; and Monkhouse, Donald C., to E. R. Squibb & Sons, Inc. Steroid formulation containing dipotassium EDTA. 4,344,940, Cl. 424-241.000.

Christensson, Erik G.: *See*—
Hernestam, Sven E. H.; Martinsson, Kjell B.; Christensson, Erik G.; and Olsson, Nils-Goran E., 4,344,952, Cl. 424-267.000.

Christian, Charlie R.; Gaskins, Jack C.; Hamrick, Jack; and Reed, Norman L., to West Point Foundry & Machine Co. High pressure sizing apparatus and method. 4,344,211, Cl. 28-183.000.

Christian Rovsing A/S: *See*—
Smitt, Asbjorn, 4,345,324, Cl. 370-14.000.

Christiansen, David W., to United States of America, Energy. Nuclear reactor fuel rod attachment system. 4,344,915, Cl. 376-437.000.

Christiansen, Hans-Marlin: *See*—
Barabas, Udo; Moehrmann, Karl-Heinz; and Christiansen, Hans-Marlin, 4,345,273, Cl. 358-86.000.

Chronowski, Robert A., to Aqua-Chem, Inc. Fluidized bed combustion device. 4,344,372, Cl. 110-245.000.

Chugai Seiyaku Kabushiki Kaisha: *See*—
Takayama, Hiroaki; Yamada, Sachiko; and Ohmori, Masayuki, 4,344,888, Cl. 260-397.200.

Ciba-Geigy Corporation: *See*—
Berner, Godwin, 4,344,876, Cl. 524-91.000.
Habicht, Ernst; Ferrini, Pier G.; and Sallmann, Alfred, 4,344,957, Cl. 424-273.00B.
Nikles, Erwin; and Karrer, Friedrich, 4,344,877, Cl. 524-102.000.
Umsonst, Gerhard; Kolliker, Hans P.; and Jost, Max, 4,344,767, Cl. 524-159.000.

Cibie Projecteurs: *See*—
Gerard, Roland; Brun, Norbert; and Ricard, Jacques, 4,345,303, Cl. 362-80.000.

Circon Corporation: *See*—
Wooff, Edward A., Jr., 4,344,667, Cl. 350-80.000.

Citizen Watch Company Limited: *See*—
Togashi, Seigo; and Tsuzuki, Akira, 4,345,248, Cl. 340-784.000.
Togashi, Seigo, 4,345,249, Cl. 340-784.000.

Citron, Manning. Overload clutch. 4,344,306, Cl. 464-34.000.

Clairol Incorporated: *See*—
Janniello, Frank, 4,345,122, Cl. 200-50.00B.

Clark Door Company, Inc.: *See*—
Hermanson, Lars, 4,344,206, Cl. 16-94.00R.

Clarke, Christopher K. P., to British Broadcasting Corporation. Processing circuit for color television signals. 4,345,268, Cl. 358-31.000.

Clavel, Raymond, to Hermes Precisa International S.A. Device for positioning the beginning of a line in a typewriter. 4,344,714, Cl. 400-334.300.

Cline, Joseph S.; and Andres, Cletus N., to Basler Electric Company. Support member. 4,345,231, Cl. 336-192.000.

Clinotherm Limited: *See*—
Shelley, Stanley J.; and Emblem, Harold G., 4,344,753, Cl. 432-3.000.

Cloutier, Edward J. F.: *See*—
Minor, Robert N.; and Cloutier, Edward J. F., 4,344,406, Cl. 123-587.000.

Cloutier, Robert P., to Eastman Kodak Company. Diaphragm and shutter mechanism. 4,344,687, Cl. 354-246.000.

Coakley, John E.: *See*—
Nolan, James J.; and Coakley, John E., 4,344,491, Cl. 175-317.000.

Coca-Cola Company, The: *See*—
Merl, Milton J., 4,344,367, Cl. 108-1.000.
Cocron, Istvan: *See*—
Stemme, Otto; Lermann, Peter; and Cocron, Istvan, 4,344,686, Cl. 354-198.000.
COFLEXIP: *See*—
Aubert, Jean-Paul; and Genini, Maurice, 4,344,462, Cl. 138-130.000.
Cohen, Milton W.: *See*—
Eldridge, John D., Jr.; and Cohen, Milton W., 4,344,532, Cl. 206-370.000.
Cole, Roger A.: *See*—
Sutcliffe, Edward Y.; and Cole, Roger A., 4,344,476, Cl. 164-76.100.
Colgate-Palmolive Company: *See*—
MacRae, David M.; and Roberts, Karl H., 4,344,930, Cl. 424-28.000.
Colomb, Denis G., to Sonics Research Corporation. System and method for high quality image reproduction. 4,345,276, Cl. 358-258.000.
Columbus, Peter S.; and Anderson, John, to Borden, Inc. Acrylic wood filler. 4,345,044, Cl. 523-220.000.
Colwell, Darrel R., to Western Electric Company, Inc. Methods and apparatus for separating cleaning solvents from rosin flux and other contaminants. 4,344,825, Cl. 203-1.000.
Commissariat a l'Energie Atomique: *See*—
Allemand, Robert; and Laval, Michel, 4,345,155, Cl. 250-385.000.
Petitcolas, Hubert, 4,345,111, Cl. 174-102.00A.
Community Light & Sound, Inc.: *See*—
Howze, Bruce, 4,344,504, Cl. 181-187.000.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Ognier, Paul; and Guilchier, Bernard, 4,344,663, Cl. 339-75.00M.
Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme): *See*—
Deproux, Jacques, 4,345,260, Cl. 346-75.000.
Compagnie Lyonnaise de Transmissions Optique: *See*—
Mignien, Georges; and Gauthier, Francis, 4,345,137, Cl. 219-121.0PK.
Congdon, James S.; and Isbell, Tim D., to National Semiconductor Corporation. Two stage thermal shutdown. 4,345,218, Cl. 330-298.000.
Conn, Calvin E.: *See*—
Gries, Robert J.; Miko, Sandor; and Conn, Calvin E., 4,345,188, Cl. 315-411.000.
Conoco Inc.: *See*—
Goldsmith, Riley G., 4,344,721, Cl. 405-224.000.
Graf, Harlan G.; Janssen, Harry R.; and Edwards, Don L., 4,344,754, Cl. 432-233.000.
Constantinescu, Spiridon. Launching tower for heavy rockets. 4,344,592, Cl. 89-1.805.
Container Corporation of America: *See*—
May, Kenneth D.; and Bell, John T., 4,344,523, Cl. 198-424.000.
Continental Conveyor & Equipment Company, Inc.: *See*—
Hooper, Homer; and Holland, R. B., 4,344,218, Cl. 29-516.000.
Continental Group, Inc., The: *See*—
Aschberger, Anton A.; and Walter, John, 4,344,545, Cl. 220-307.000.
Walter, John, 4,345,047, Cl. 525-108.000.
Contraves AG: *See*—
Heller, Rudolf; and Schindler, Walter, 4,344,595, Cl. 248-542.000.
Convey Systems Div. of Export Tool & Welding Co. Ltd.: *See*—
Potts, Roger F., 4,344,448, Cl. 134-73.000.
Cooper, James A.: *See*—
Deckas, Peter C.; Cooper, James A.; and Leebens, James V., Jr., 4,344,784, Cl. 55-473.000.
Cooper, Tom: *See*—
Loechel, Hans-Peter; and Cooper, Tom, 4,345,006, Cl. 428-473.000.
Copco Door Company: *See*—
King, Clarence H., 4,344,256, Cl. 49-501.000.
Coppens, Guillaume, to Solvay & Cie. Process for the manufacture of aldonic acids by an enzymatic method. 4,345,031, Cl. 435-137.000.
Coppens, Guillaume: *See*—
Gago, Ignace; and Coppens, Guillaume, 4,344,979, Cl. 427-4.000.
Copping, Leonard G.; Kerry, John C.; Watkins, Thomas I.; Willis, Robert J.; and Palmer, Bryan H., to Boots Company Limited, The. Pesticide compounds. 4,344,893, Cl. 260-456.00A.
Corbe, Jean A.: *See*—
Grange, Andre A.; and Corbe, Jean A., 4,344,983, Cl. 427-46.000.
Cordes, Charles P. Rim shot segment. 4,344,349, Cl. 84-411.00R.
Corman, Ned E.; Kandybowski, Steven J.; Scheingold, William S.; and Youngfleish, Frank C., to AMP Incorporated. Active device substrate connector having a heat sink. 4,345,267, Cl. 357-81.000.
Cornell Research Foundation, Inc.: *See*—
Zall, Robert R.; and Dzurec, David J., 4,344,970, Cl. 426-40.000.
Corning Glass Works: *See*—
Blankenship, Michael G., 4,344,670, Cl. 350-96.310.
Cosmos Investigations and Research Societe Francaise a Responsabilite Limitee: *See*—
Leroy, Claude, 4,344,418, Cl. 126-443.000.
Cotoara, Dimitru: *See*—
Bleiweiss, Arthur F.; Cotoara, Dimitru; and Wilkes, Robert J., 4,344,672, Cl. 350-288.000.
Cotter, Thomas P.: *See*—
Jarrett, Harold M., Jr.; and Cotter, Thomas P., 4,344,302, Cl. 62-514.00R.
Cotton Machinery Company, Inc.: *See*—
Gaudette, Andrew J.; Dana, Dave A.; and Haney, Donald, 4,344,272, Cl. 56-16.600.
Coura, Herbert R.: *See*—
Tuchenhagen, Otto A. P.; Mieth, Hans O. E.; and Coura, Herbert R., 4,344,453, Cl. 137-240.000.
Cournoyer, Richard L.; and Foley, James W., to Polaroid Corporation. Photographic products and processes with a pH sensitive xanthene light screening dye. 4,345,017, Cl. 430-221.000.
Cowan, Jack C.; and Thrash, Tommy, to Venture Chemicals, Inc. Method of recovering polyester fibers and cellulosic powder from polyester/cotton textile waste. 4,345,039, Cl. 521-48.000.
Craig, Ernest M.; and Minor, John M., to Golden Skillet Corporation. Food warming and cooking cabinet. 4,345,143, Cl. 219-411.000.
Craighead, Harold G.; Howard, Richard E.; and Tennant, Donald M., to Bell Telephone Laboratories, Incorporated. Selectively etched bodies. 4,344,816, Cl. 156-643.000.
Creusot-Loire: *See*—
Pere, Gerard, 4,344,834, Cl. 204-278.000.
Crisp, David J.: *See*—
Jobling, Alan V.; and Crisp, David J., 4,344,273, Cl. 56-16.700.
Criton, Eric: *See*—
Kaplan, Daniel; Landouar, Pierre; and Criton, Eric, 4,344,984, Cl. 427-74.000.
Crompton, George. Multi-wheel windmill electro-generator. 4,345,161, Cl. 290-55.000.
Cropley, Jean B., to Union Carbide Corporation. Process for the production of ethylene glycol. 4,345,104, Cl. 568-852.000.
Cross, Thomas R., to Xerox Corporation. Stapling apparatus. 4,344,554, Cl. 227-30.000.
CSELT-Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See*—
Bernardini, Vincenzo; Garetti, Enzo; and Manfreddi, Renato, 4,345,319, Cl. 365-210.000.
Gandini, Marco; and Viale, Ernesto, 4,345,325, Cl. 370-29.000.
Csutak, Janos: *See*—
Novak, Lajos; Szantay, Csaba: Rohaly, Janos; Kis-Tamas, Attila; Varjas, Laszlo; and Csutak, Janos, 4,344,959, Cl. 424-279.000.
CTS Corporation: *See*—
Stuckey, Ronald L., 4,345,300, Cl. 361-386.000.
Cull, Neville L.; and Sawyer, Willard H., to Exxon Research & Engineering Co. Hydroprocessing catalysts. 4,344,867, Cl. 252-439.000.
Cullen, Ernest; Possanza, Genus; and Stewart, Patrick B., to Boehringer Ingelheim GmbH. 2,6-Diamino-benzo[1,2-d:5,4-d']bisthiazoles and salts thereof. 4,344,946, Cl. 424-250.000.
Cullen, James H., to Sperry Corporation. Character overprinting method and apparatus in non-impact printers. 4,344,713, Cl. 400-22.000.
Cummins Engine Company, Inc.: *See*—
Heydrich, Hans; Woods, Melvin E.; and Geary, William C., 4,344,390, Cl. 123-41.82A.
Cunningham, Cecil R.: *See*—
Symborski, Alex P.; and Cunningham, Cecil R., 4,344,786, Cl. 65-2.000.
Cunningham, Vernon R., to Rockwell International Corporation. Split phase delay equalizer with stray reactance compensation. 4,345,222, Cl. 333-28.00R.
Curiel, Georg; and Naguib, Moustafa M., to BBC Brown, Boveri & Company, Ltd. Two-stage supercharging apparatus. 4,344,289, Cl. 60-612.000.
Curran, Roger J., to Victor United, Inc. Gas-fired gun with gas cartridge loading and extraction assembly. 4,344,410, Cl. 124-80.000.
Czech, Franz; Mauthe, Gerhard; and Pfrotzschner, Hans, to BBC Brown, Boveri & Company, Ltd. Electrical switch. 4,345,129, Cl. 200-163.000.
Czoch, Jerzy W.; and Seagrove, Douglas J. W., to Molins Limited. Monitoring flow of rod-like articles. 4,344,520, Cl. 198-347.000.
Dahlberg, Reinhard, to Licentia Patent-Verwaltungs-G.m.b.H. Electrode system for a fuel or electrolysis cell arrangement. 4,344,832, Cl. 204-258.000.
Daihatsu Motor Co., Ltd.: *See*—
Fujihara, Youji; Shiba, Masami; Hazama, Toshio; and Kito, Shozo, 4,344,514, Cl. 192-3.580.
Daikin Kogyo Co., Ltd.: *See*—
Ueno, Fumito; and Fukuhara, Kunio, 4,344,297, Cl. 62-196.00C.
Daimler-Benz Aktiengesellschaft: *See*—
Dudeck, Ingo; and Maass, Manfred, 4,344,318, Cl. 73-35.000.
Daiwa Can Company: *See*—
Wakamatsu, Atsuyuki; and Tonooka, Keisuke, 4,344,268, Cl. 53-384.000.
Daiwa Corporation: *See*—
Isobe, Toshiyuki, 4,344,623, Cl. 273-153.00S.
Daiwa Shinku Corporation: *See*—
Takemura, Seinosuke, 4,345,118, Cl. 179-110.00A.
Dalamangas, Chris A.; and Piccirillo, Thomas P., to Technical Wire Products, Inc. Retainer for elastomeric electrical connector. 4,344,662, Cl. 339-59.00M.
Dana, Dave A.: *See*—
Gaudette, Andrew J.; Dana, Dave A.; and Haney, Donald, 4,344,272, Cl. 56-16.600.
Dancsi, Lajos: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Dancsi, Lajos; Keve, Tibor; and Gazdac, Maria, 4,345,082, Cl. 546-51.000.
Dannert, Horst: *See*—
Hirsch, Hans J.; and Dannert, Horst, 4,345,012, Cl. 430-48.000.

Dantzer, Elonne: *See—*
Goldfarb, Adolph E.; and Dantzer, Elonne, 4,344,249, Cl. 46-151.000.

Darcy, John J.: *See—*
Leise, Walter F.; and Darcy, John J., 4,344,612, Cl. 271-162.000.

Dart Industries, Inc.: *See—*
Jennings, Thomas C.; and Fletcher, Charles W., Jr., 4,345,045, Cl. 524-180.000.

Dataproducts Corporation: *See—*
Van Horne, Arthur C.; and Yarp, Russel E., 4,344,715, Cl. 400-616.100.

Dathe, Joachim; and Schmidhuber, Erich, to Siemens Aktiengesellschaft. Case for a semiconductor component. 4,345,108, Cl. 174-52.00H.

Davidson, James D. Energy conserving building structural elements normally called window or door frames. 4,344,265, Cl. 52-741.000.

Davis, James A.; MacPherson, William F.; Mussman, Harry E.; and Shackle, Peter W., to Bell Telephone Laboratories, Incorporated. Control circuitry for high voltage solid-state switches. 4,345,163, Cl. 307-252.00A.

Davis, Kirk E.; and Holden, Thomas F., to Lubrizol Corporation, The. Sulfurized compositions. 4,344,854, Cl. 252-45.000.

Dean, Terence F., to EMI Limited. Torque limiting device. 4,344,590, Cl. 242-201.000.

Dearborn, Howard K. Heat exchanger for space heaters. 4,344,411, Cl. 126-34.000.

Dearman, Timothy C. Pipefitter's tool. 4,344,215, Cl. 29-281.500.

Debaigt, Jean, to CGEE Alsthom. Rotary switch with an automatic re-setting mechanism. 4,345,226, Cl. 335-166.000.

De Blauwe, Francis J. A. M. C., to N.V. Raychem S.A. Thermochromic composition. 4,344,909, Cl. 264-230.000.

Debski, Andre J. Exercise vest. 4,344,620, Cl. 272-119.000.

De Busscher, Cyriel R. J.; Deleu, Walter V.; and Van Herpe, Francois, to Sperry Corporation. Cleaning apparatus of combine harvesters. 4,344,443, Cl. 130-272.000.

Deckas, Peter C.; Cooper, James A.; and Leebens, James V., Jr., to Dexon, Inc. Filter assembly for clean air rooms and work stations. 4,344,784, Cl. 55-473.000.

Deen, Harold E.: *See—*
Gutierrez, Antonio; Brois, Stanley J.; Ryer, Jack; and Deen, Harold E., 4,344,853, Cl. 252-33.600.

Deere & Company: *See—*
Casterton, Robert H.; Phippen, Larry J.; and Wright, Darrell L., 4,344,356, Cl. 98-2.110.
Reich, Steven A., 4,345,234, Cl. 337-336.000.
Schlueter, Francis E.; and Kent, Brian E., 4,344,271, Cl. 56-13.600.

De Felice, Wilfried, to Hoechst Aktiengesellschaft. Spray applicator. 4,344,573, Cl. 239-320.000.

Deforeit, Christian T. Polyphonic digital synthesizer of periodic signals. 4,344,343, Cl. 84-1.010.

Degussa AG: *See—*
Kleemann, Axel; Lussling, Theodor; Pfeifer, Wolf; and Scherberich, Paul, 4,345,072, Cl. 542-442.000.
Szulczyk, Andreas, 4,344,794, Cl. 75-173.00C.

Dehertefelt, Henri: *See—*
Bolssens, Frans P. J.; Franck, Guy C. J. L. G. G. M.; and Dehertefelt, Henri, 4,344,212, Cl. 29-33.00F.

Dehn + Sohne + Co. KG: *See—*
Hasse, Peter; Wiesinger, Johannes; and Pivit, Erich, 4,345,293, Cl. 361-117.000.
Hasse, Peter; Wiesinger, Johannes; and Pivit, Erich, 4,345,295, Cl. 361-130.000.

Dehnert, Johannes; and Juenemann, Werner, to BASF Aktiengesellschaft. Disazo dyestuffs having an acylamino group and an aromatic-oxy group on different terminal moieties. 4,344,880, Cl. 260-152.000.

Del Laboratories, Inc.: *See—*
Gordon, Harry W., 4,344,932, Cl. 424-61.000.

deLarosiere, Pierre J., to International Container Systems, Inc. Case for beverage bottles. 4,344,530, Cl. 206-203.000.

DeLaurentis, Angelo A., to Westinghouse Electric Corp. Non-metallic core band. 4,345,232, Cl. 336-210.000.

de Leeuw, Johannes A. N.; and Brugmans, Johannes T., to Koninklijke Emballage Industrie Van Leer. Metallized composite structure and a method of preparing same. 4,344,998, Cl. 428-212.000.

Deleu, Walter V.: *See—*
De Busscher, Cyriel R. J.; Deleu, Walter V.; and Van Herpe, Francois, 4,344,443, Cl. 130-272.000.

de Masi, Erika. Device for the lamination of insulating boards. 4,344,812, Cl. 156-499.000.

DeMoss, Dean; and Richardson, Harvey J., to Burroughs Corporation. Floppy pack with variably-spaced isolation means. 4,345,285, Cl. 360-133.000.

Demoute, Jean-Pierre: *See—*
Martel, Jacques; Tessier, Jean; Teche, Andre; and Demoute, Jean-Pierre, 4,344,895, Cl. 260-465.00F.

Demus, Dietrich; Zaschke, Horst; Vorbrodt, Hans-Mathias; Kresse, Horst; and Weissflog, Wolfgang, to VEB Werk fur Fernsehelektronik Berlin im VEB Kombinat Mikroelektronik. Crystalline-liquid substituted 1,3-dioxanes and mixtures containing them. 4,344,856, Cl. 252-299.610.

Dennesen, Francis G.: *See—*
Dennesen, Joseph C.; and Dennesen, Francis G., 4,344,807, Cl. 156-155.000.

Dennesen, Joseph C.; and Dennesen, Francis G. Spiral winding of filaments. 4,344,807, Cl. 156-155.000.

Dentsply Research & Development Corp.: *See—*
Folkenroth, Richard P.; and Dunn, Thomas J., 4,344,756, Cl. 433-92.000.

Denzinger, Walter; Straub, Ferdinand; and Hartmann, Heinrich, to BASF Aktiengesellschaft. Preparation of polyvinylpyrrolidone-iodine. 4,345,049, Cl. 525-339.000.

Deppenbrock, Christoph: *See—*
Liebert, Karl-Heinz; Tischer, Werner; and Deppenbrock, Christoph, 4,344,283, Cl. 60-384.000.

Deproux, Jacques, to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme). Ink jet printer with carriage velocity compensation. 4,345,260, Cl. 346-75.000.

Derschmidt, Hans; and Frommlet, Hubert, to Messerschmitt-Boelkow-Blohm GmbH. Hingeless and bearingless multiblade rotor for rotary wing aircraft. 4,344,739, Cl. 416-141.000.

de Rudder, Jean: *See—*
Leclerc, Jean; and de Rudder, Jean, 4,344,935, Cl. 424-89.000.

Dettling, Theodore J. Urethane prepolymer repair system. 4,345,058, Cl. 528-48.000.

Devaney, Howard F.: *See—*
Abbin, Joseph P., Jr.; Devaney, Howard F.; and Hake, Lewis W., 4,345,124, Cl. 200-61.530.

DeVault, Albert N.: *See—*
Bonazza, Benedict R.; and DeVault, Albert N., 4,344,771, Cl. 44-63.000.

Devro, Inc.: *See—*
Easton, Ian A.; Glen, James M.; and Kieran, Ann G., 4,344,967, Cl. 424-359.000.

Dexon, Inc.: *See—*
Deckas, Peter C.; Cooper, James A.; and Leebens, James V., Jr., 4,344,784, Cl. 55-473.000.

Diamond, Arthur S.; and Floersheim, Sydney N., to Black Copy Company, Inc. Dual purpose magnetic toner. 4,345,013, Cl. 430-106.600.

Diamond Shamrock Corporation: *See—*
Niksa, Andrew J., 4,344,633, Cl. 277-228.000.

Dickie, Ira A.: *See—*
Jerry, James H.; and Dickie, Ira A., 4,344,501, Cl. 180-253.000.

Diesner, Ferdinand: *See—*
Muller, Jakob; and Diesner, Ferdinand, 4,344,463, Cl. 139-383.00R.

Dieterlen, Paul E.; and Benner, Harold T., Jr., to R. A. Jones & Co. Inc. Pouch forming and filling mechanism with provision for increasing the capacity of the pouches. 4,344,269, Cl. 53-459.000.

Dietze, Wolfgang, to Siemens Aktiengesellschaft. Directly heatable semiconductor tubular bodies. 4,345,142, Cl. 219-390.000.

Dietzsch, Kurt, to Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG. Multiple flow condenser for air conditioning units of motor vehicles. 4,344,482, Cl. 165-172.000.

Dieudonne, Marc P. G.; and Raillard, Yves G., to Le Materiel Telephonique Thomson-CSF. Switching network and telecommunications center comprising such a network. 4,345,326, Cl. 370-60.000.

Digital Equipment Corporation: *See—*
Arulpragasam, Jega A.; Giggi, Robert A.; Lary, Richard F.; and Sullivan, Daniel T., 4,345,309, Cl. 364-200.000.

Dillon, Nicholas T. E. Welding and cutting handpiece. 4,344,606, Cl. 266-66.000.

Dima, Attila F.: *See—*
Silver, David A.; Dima, Attila F.; and Seman, George W., 4,345,109, Cl. 174-84.00R.

Dimetrics, Inc.: *See—*
Lesher, Howard D.; and Taff, James T., 4,344,553, Cl. 226-168.000.

Discovision Associates: *See—*
Wilkinson, Richard L., 4,345,261, Cl. 346-76.00L.

Dismuke, Keith I.: *See—*
Schmidt, Donald L.; Pruitt, Malcolm E.; and Dismuke, Keith I., 4,344,993, Cl. 428-35.000.

Ditzig, Albert F., to Molex Incorporated. Method of making hermetically sealed switch assembly. 4,344,224, Cl. 29-622.000.

Doane, William M.: *See—*
Shasha, Baruch S.; Doane, William M.; and Russell, Charles R., deceased, 4,344,857, Cl. 252-316.000.

Dolbeare, Frank A., to United States of America, Energy. Fluorometric method of quantitative cell mutagenesis. 4,345,027, Cl. 435-21.000.

Dolce, Thomas J., to General Electric Company. Flame retardant, non-dripping linear polyester compositions. 4,344,878, Cl. 524-409.000.

Dolfsma, Hendrik: *See—*
Vermeiren, Karel N.; Heemskerk, Rutgerus S.; and Dolfsma, Hendrik, 4,345,203, Cl. 324-61.00R.

Dominion Auto Accessories Limited: *See—*
Bleiweiss, Arthur F.; Cotoara, Dimitru; and Wilkes, Robert J., 4,344,672, Cl. 350-288.000.

Dorawala, Tansukhlal G.: *See—*
Reinhard, Russell R.; Dorawala, Tansukhlal G.; and Kerr, Edwin R., 4,344,865, Cl. 252-420.000.

Doriath, Georges: *See—*
Carre, Roland; and Doriath, Georges, 4,345,252, Cl. 343-5.0NQ.

Doty, Mitchell E.: *See—*
Fulop, Gabor F.; Betz, Jacob F.; Meyers, Peter V.; and Doty, Mitchell E., 4,345,107, Cl. 136-255.000.

Double, Glen P., to International Business Machines Corporation. Acceleration correction for self-clocking write-head. 4,345,278, Cl. 360-2.000.

Doucet, Henri; and Tournes, Christian, to Agence Nationale de Valorisation de la Recherche (ANVAR). Free-electron laser provided with a device for producing a pulsed magnetic field with periodic spatial variations. 4,345,329, Cl. 372-2.000.

Dow Chemical Company, The: *See—*
Broersma, Robert J., Jr.; and Spittka, Gayle A., 4,344,958, Cl. 424-273.00R.
Friedli, Hans R.; and Boriack, Clinton J., 4,345,048, Cl. 525-192.000.
Lorette, Nicholas B.; and Fosnaugh, Jerry L., 4,344,916, Cl. 422-40.000.
Schmidt, Donald L.; Pruitt, Malcolm E.; and Dismuke, Keith I., 4,344,993, Cl. 428-35.000.
Strege, Paul E.; and Renga, James M., 4,344,881, Cl. 549-229.000.

Dow Corning Corporation: *See—*
Lutz, Michael A., 4,344,800, Cl. 106-308.00Q.
Plueddemann, Edwin P., 4,344,860, Cl. 252-389.00R.

Downing, Michael W.: *See—*
Nelson, Robert L.; and Downing, Michael W., 4,345,028, Cl. 435-30.000.

Dragerwerk Aktiengesellschaft: *See—*
Heim, Ulrich, 4,345,151, Cl. 250-341.000.

Drexhage, Karl H., to Eastman Kodak Company. Color imaging devices and color filter arrays using photo-bleachable dyes. 4,345,011, Cl. 430-7.000.

Drum, Harry R. Toilet tissue holder. 4,344,583, Cl. 242-55.200.

Dry, Sidney, to Natico, Inc. Reusable tight head drum by conversion to open head drum. 4,344,546, Cl. 220-320.000.

Du Pont Canada Inc.: *See—*
Kendall, John A.; Marchildon, Ernest K.; and Stephenson, Grant R., 4,344,711, Cl. 366-83.000.

Dubey, Dennis, to Forest Country Engineering Co. Delimbing apparatus. 4,344,470, Cl. 144-2.00Z.

Dudeck, Ingo; and Maass, Manfred, to Daimler-Benz Aktiengesellschaft. Undesirable combustion characteristic detector for spark-ignited internal combustion engines. 4,344,318, Cl. 73-35.000.

Dudley, William H. Exercise apparatus. 4,344,618, Cl. 272-117.000.

Duff, John; and McFarlane, Peter, to Joy Manufacturing Company. Hammer. 4,344,353, Cl. 91-165.000.

Duffy, Edward A.: *See—*
Horne, C. James; and Duffy, Edward A., 4,344,567, Cl. 237-1.00R.

Dumas et Inchauspe: *See—*
Inchauspe, Nicolas, 4,344,889, Cl. 260-400.000.

Duncan, Gary L.: *See—*
All, Frank E.; and Duncan, Gary L., 4,345,005, Cl. 428-461.000.

Duncan, James S.: *See—*
Pines, Michael Y.; Whitney, Colin G.; and Duncan, James S., 4,345,148, Cl. 250-214.00C.

Dunkle, Steven L.: *See—*
Williams, Leo M., Jr.; and Dunkle, Steven L., 4,344,637, Cl. 280-21.00R.

Dunn, Luther L.: *See—*
Burkett, Ronald J.; and Dunn, Luther L., 4,344,793, Cl. 75-81.000.

Dunn, Thomas J.: *See—*
Folkenroth, Richard P.; and Dunn, Thomas J., 4,344,756, Cl. 433-92.000.

Dupin, Thierry; Bouge, Gilbert; and Seigneurin, Laurent, to Rhone-Poulenc Industries. Process for preparing alumina particulates, at least a fraction of which being ultrafine boehmite. 4,344,928, Cl. 423-626.000.

Du Pont de Nemours, E. I., and Company: *See—*
Resnick, Paul R., 4,345,092, Cl. 560-182.000.
Romanauskas, William A., 4,344,563, Cl. 233-26.000.
Sandberg, Harry W., 4,344,468, Cl. 141-69.000.

Dvorak, Lester I. Egg transfer apparatus. 4,344,730, Cl. 414-405.000.

Dzurec, David J.: *See—*
Zall, Robert R.; and Dzurec, David J., 4,344,970, Cl. 426-40.000.

E-A-R Corporation: *See—*
Baker, David E., 4,344,621, Cl. 273-26.00A.

E. R. Squibb & Sons, Inc.: *See—*
Bernstein, Jack; Varma, Ravi K.; Vogt, B. Richard; and Weisenborn, Frank L., 4,345,096, Cl. 562-465.000.
Chow, Wing-Sun; and Monkhouse, Donald C., 4,344,940, Cl. 424-241.000.

E-Systems, Inc.: *See—*
Jackson, Charles R., 4,345,219, Cl. 331-1.00A.

E. W. Buschman Company, The: *See—*
Vogt, Robert K.; and Heit, Martin A., 4,344,527, Cl. 198-781.000.

Eastcott, Peter deH.; Truman, Peter T.; and Scuccato, Serge L., to Canadian General Electric Company Limited. Self-adjusting brake engine limit switch assembly. 4,345,123, Cl. 200-52.00R.

Eastman Kodak Company: *See—*
Cloutier, Robert P., 4,344,687, Cl. 354-246.000.
Drexhage, Karl H., 4,345,011, Cl. 430-7.000.
Kim, Chang Kyu; Maggiulli, Cataldo A.; and Zielinski, Paul A., 4,345,085, Cl. 548-360.000.
Stuermer, Paul A.; and Blazey, Richard N., 4,344,677, Cl. 354-5.000.
Zeman, Robert E., 4,344,698, Cl. 355-16.000.

Easton, Ian A.; Glen, James M.; and Kieran, Ann G., to Devro, Inc. Film forming composition and uses thereof. 4,344,967, Cl. 424-359.000.

Eaton Corporation: *See—*
Jaeschke, James R.; and Rutchik, Walter L., 4,345,292, Cl. 361-94.000.
Matthies, Alan A., 4,345,233, Cl. 337-75.000.
Tenner, Richard B., 4,345,121, Cl. 200-42.00R.

Eberle, William J.: *See—*
Oxenreider, Terry; and Eberle, William J., 4,344,748, Cl. 425-143.000.

Echols, James M.; and Bouwhuis, Richard W., to Sperry Corporation. Rolling rack control means. 4,344,728, Cl. 414-39.000.

Ecolaire Incorporated: *See—*
Boyer, Robert C.; and Williams, George J., 4,344,480, Cl. 165-162.000.

Edling, Robert J., to University of Nebraska, The Board of Regents of the. Self-irrigating pot for plants. 4,344,251, Cl. 47-80.000.

Edward Weck & Company, Inc.: *See—*
Giersch, Robert V. C., 4,344,531, Cl. 206-339.000.

Edwards, Don L.: *See—*
Graf, Harlan G.; Janssen, Harry R.; and Edwards, Don L., 4,344,754, Cl. 432-233.000.

Eggert, Carl A.: *See—*
Barger, Danny R.; Eggert, Carl A.; and Lloyd, Paul O., 4,345,193, Cl. 318-612.000.

Eglinton, Robert B., to Paxall, Inc. Sheet handling apparatus. 4,344,585, Cl. 242-66.000.

Egyt Gyogyszervegyeszeti Gyar: *See—*
Novak, Lajos; Szantay, Csaba; Rohaly, Janos; Kis-Tamas, Attila; Varjas, Laszlo; and Csutak, Janos, 4,344,959, Cl. 424-279.000.

Ehrhardt, Horst, to Bjurman, Susan; and Babcock, Barbara. Combined scalp and hair care products and method. 4,344,446, Cl. 132-7.000.

Eiche, Hans, to Kunz Maschinen- u. Apparatebau GmbH. Coupling for mandrels or the like. 4,344,304, Cl. 464-85.000.

Eichelberger, Charles W.; and Wojnarowski, Robert J., to General Electric Company. Abrasion-resistant screen-printed potentiometer. 4,345,236, Cl. 338-176.000.

Eichelberger, Charles W.: *See—*
Bedard, James F.; Eichelberger, Charles W.; and Nati, Salvatore F., Jr., 4,345,200, Cl. 323-350.000.

Eimen, Shawn H., to Milsco Manufacturing Company. Vehicle seat with fore-and-aft shock isolation. 4,344,597, Cl. 248-561.000.

Eisai Co., Ltd.: *See—*
Machida, Yoshimasa; Saito, Isao; Nomoto, Seiichiro; Negi, Shigeto; Ikuta, Hironori; and Kitoh, Kyosuke, 4,344,944, Cl. 424-246.000.

Ejk, Adam J.; and Krzywicki, Donald J., to Tenneco Chemicals, Inc. Calendering of polyolefins. 4,345,046, Cl. 524-223.000.

Elastogran Maschinenbau GmbH & Co.: *See—*
Kelterbaum, Manfred, 4,344,919, Cl. 422-133.000.

Eldridge, John D., Jr.; and Cohen, Milton W., to Instranetics, Inc. Surgical blade remover. 4,344,532, Cl. 206-370.000.

Elk River Resources, Inc.: *See—*
Thompson, Buster R., 4,344,820, Cl. 201-15.000.

Elleman, Daniel D.: *See—*
United States of America, National Aeronautics and Space Administration; Wang, Taylor G.; and Elleman, Daniel D., 4,344,787, Cl. 65-21.400.

Ellingson, Hartley, to Frontier, Inc. Vacuum grain moving apparatus. 4,344,723, Cl. 406-53.000.

Elliott, Brian J., to International Business Machines Corporation. Apparatus for determining pen acceleration. 4,345,239, Cl. 340-146.3SY.

Ellslager, William M.: *See—*
Zucker, Newton; and Ellslager, William M., 4,344,858, Cl. 252-358.000.

Eltra Corporation: *See—*
Vella, Louis C.; and Hansen, Walter I., 4,345,245, Cl. 340-744.000.

Emblem, Harold G.: *See—*
Shelley, Stanley J.; and Emblem, Harold G., 4,344,753, Cl. 432-3.000.

EMI Limited: *See—*
Dean, Terence F., 4,344,590, Cl. 242-201.000.

Emmett, James S.: *See—*
Chen, Evan N.; Emmett, James S.; Ferraro, Frank A.; and Peleckis, Anthony J., 4,344,227, Cl. 30-41.000.

Endo, Hiroyuki; and Ikenoue, Yutaka, to Hitachi Powdered Metals Company, Ltd. Iron-based sintered sliding product. 4,344,795, Cl. 75-230.000.

Endress u. Hauser GmbH u. Co.: *See—*
Kompa, Gunter; and Stock, Don J. R., 4,344,705, Cl. 356-5.000.

Energy Conversion Devices, Inc.: *See—*
Klose, Peter H.; and Ovshinsky, Herbert C., 4,344,701, Cl. 355-51.000.

Enso- Gutzeit Osakeyhtio : *See—*
Hakulinen, Risto R., 4,344,848, Cl. 210-617.000.

Entreprise Generale de Chauffage Industriel Pillard: *See—*
Pillard, Jean-Claude, 4,344,772, Cl. 48-76.000.

Equipment Company of America: *See—*
Albin, Michael J., 4,344,551, Cl. 225-86.000.

Ercoli, Nicolo. Oxotetrahydrothiophenes. 4,344,956, Cl. 424-272.000.

Erickson, Erick E.; and Licitis, Gunars, Sr., to Marvin Glass & Associates. Musical light toy. 4,344,346, Cl. 84-1.180.

Erickson, Wayne. Extensible socket wrench. 4,344,340, Cl. 81-177.00A.

Ernst, Edwin R.: *See—*
Robbins, Max L.; and Ernst, Edwin R., 4,344,863, Cl. 252-192.000.

Ernst Flitsch GmbH & Co.: *See—*
Gotzenberger, Rudibert, 4,344,566, Cl. 236-92.00B.

Essex Chemical Corp.: *See—*
Rizk, Sidky D.; Hsieh, Harry W. S.; and Prendergast, John J., 4,345,053, Cl. 525-440.000.

Etienne, Michel, to Automobiles Peugeot; and Societe Anonyme Automobiles Citroen. Transmission mechanism comprising a clutch and a gear box having a plurality of speed ratios. 4,344,513, Cl. 192-.02R.

Etoh, Yukihiro; Tanaka, Toshiaki; Sugasawa, Fukashi; and Iizuka, Haruhiko, to Nissan Motor Company, Limited. Internal combustion engine. 4,344,393, Cl. 123-198.00F.

Evans, Anthony; Lesniak, John M.; and Boardman, Franklin, to Johnson & Johnson. Orthopedic bandage having improved catalyst system. 4,344,423, Cl. 128-90.000.
Exxon Production Research Company: *See—*
Butler, Roger M., 4,344,485, Cl. 166-271.000.
Exxon Research and Engineering Company: *See—*
Burke, Oliver W., Jr., 4,344,859, Cl. 252-359.00D.
Cull, Neville L.; and Sawyer, Willard H., 4,344,867, Cl. 252-439.000.
Gutierrez, Antonio; Brois, Stanley J.; Ryer, Jack; and Deen, Harold E., 4,344,853, Cl. 252-33.600.
McCandlish, Larry E.; Wright, Franklin J.; and Kugler, Edwin L., 4,345,038, Cl. 518-711.000.
Robbins, Max L.; and Ernst, Edwin R., 4,344,863, Cl. 252-192.000.
F. L. Smidth & Co.: *See—*
Hjaeresen, Paul T., 4,344,596, Cl. 248-550.000.
Fahle, Ronald W.; and Reiser, Carl A., to United Technologies Corporation. Fuel cell stack compressive loading system. 4,345,009, Cl. 429-37.000.
Fahlstrom, George B., to Osmose Wood Preserving Co. of America, *inc.* Method for treatment of wood using a reactive closure means to provide a time delayed release of the treating agent. 4,344,250, Cl. 47-57.500.
Fahmy, Mohamed A. H.; and Fukuto, Tetsuo R., to University of California, The Regents of the. Production of N-chlorosulfinylcarbamate esters. 4,344,883, Cl. 549-467.000.
Fahy, William J.; and Luborsky, Fred E., to General Electric Company. Electro-deposition of a nonmagnetic conductive coating for memory wire protection. 4,345,007, Cl. 428-679.000.
Falck, Glenn H.; and Boose, James R., to Koppers Company, Inc. Fines removal in horizontal coolers. 4,344,524, Cl. 198-494.000.
Fallos, George: *See—*
Orsinger, Winston A.; and Fallos, George, 4,344,729, Cl. 414-226.000.
Farmitalia Carlo Erba S.p.A.: *See—*
Suarato, Antonino; Penco, Sergio; and Arcamone, Federico, 4,345,070, Cl. 536-17.00A.
Suarato, Antonio; Penco, Sergio; and Arcamone, Federico, 4,345,068, Cl. 536-17.00A.
Farmont, Johann H. Building log with high thermal insulation characteristics. 4,344,263, Cl. 52-233.000.
Farr, Aaron V.; and Saunders, Robert L., to Abex Corporation. Bridge brake system. 4,344,200, Cl. 14-71.500.
Faulkner, Alfred H. Digital envelope generator. 4,344,347, Cl. 84-1.260.
Feal S.p.A.: *See—*
Varlonga, Giovanni, 4,344,254, Cl. 49-401.000.
Feehery, William J., Jr.: *See—*
Salmonsen, Andrew R.; and Feehery, William J., Jr., 4,344,493, Cl. 177-52.000.
Ferranti Limited: *See—*
Chilcot, Arthur L., 4,344,905, Cl. 264-111.000.
Howie, James B.; and McLeod, John, 4,345,330, Cl. 372-29.000.
Ferraro, Frank A.: *See—*
Chen, Evan N.; Emmett, James S.; Ferraro, Frank A.; and Peleckis, Anthony J., 4,344,227, Cl. 30-41.000.
Ferrini, Pier G.: *See—*
Habicht, Ernst; Ferrini, Pier G.; and Sallmann, Alfred, 4,344,957, Cl. 424-273.00B.
Ferris, James J. Engine apparatus. 4,344,742, Cl. 417-343.000.
Fetterman, Robert C.: *See—*
Schwartz, S. Robert; Swan, William E., Jr.; Fetterman, Robert C.; and Neubaum, Victor A., deceased, 4,344,822, Cl. 201-39.000.
Feuerherd, Karl-Heinz: *See—*
Koenig, Karl-Heinz; Schwendemann, Volker; and Feuerherd, Karl-Heinz, 4,344,891, Cl. 260-453.00A.
Fichtel & Sachs AG: *See—*
Kolb, Dieter, 4,344,516, Cl. 192-114.00R.
Fidelity Union Trust Company, Executor: *See—*
Schneider, Louis; Graham, David E., deceased; and Fidelity Union Trust Company, Executor, 4,344,788, Cl. 71-76.000.
Fielden, John S., to South Eastern Electricity Board. Electronic kilowatt-hour meter for measuring electrical energy consumption. 4,345,311, Cl 364-483.000.
File, Joseph: *See—*
Sloyan, Jerome J., 4,344,598, Cl. 248-651.000.
Finchimica S.R.L.: *See—*
Blandamura, Manlio, 4,344,942, Cl. 424-243.000.
Finike Italiana Marposs S.p.A.: *See—*
Albertazzi, Gastone, 4,344,233, Cl. 33-178.00E.
Fink, Lothar; and Wojcichowski, Lothar, to Klockner-Werke AG. Mold apparatus with elastic clamping means. 4,344,601, Cl. 249-167.000.
Finkelston, Robert J., to SPS Technologies, Inc. Apparatus and method for tightening an assembly. 4,344,216, Cl. 29-407.000.
Firestone Tire & Rubber Company, The: *See—*
Rumpf, Robert J., 4,344,589, Cl. 242-107.40A.
Fisher, Alan J. Electrical peak detector. 4,345,168, Cl. 307-351.000.
Fisher, Charles B.; and Fisher, Sidney T. Multiple-site underground magnetic heating of hydrocarbons. 4,344,483, Cl. 166-248.000.
Fisher, Sidney T.: *See—*
Fisher, Charles B.; and Fisher, Sidney T., 4,344,483, Cl. 166-248.000.
Flamme, Walter; and Rahn, Oskar, to Peltzer & Ehlers GmbH & Co. Forming press with a cam arrangement. 4,344,312, Cl. 72-452.000.
Flanders, Thomas E., to General Electric Co. Levitated ball inclinometer. 4,344,235, Cl. 33-366.000.
Fleischer, Henry. Folding baby carriers. 4,344,649, Cl. 297-30.000.
Fletcher, Charles W., Jr.: *See—*
Jennings, Thomas C.; and Fletcher, Charles W., Jr., 4,345,045, Cl. 524-180.000.
Flexible Steel Lacing Company: *See—*
Pray, Winston C., 4,344,213, Cl. 29-243.500.
Flik, Inc.: *See—*
Kolm, Henry H.; and Kolm, Eric A., 4,345,305, Cl. 362-186.000.
Floersheim, Sydney N.: *See—*
Diamond, Arthur S.; and Floersheim, Sydney N., 4,345,013, Cl. 430-106.600.
FMC Corporation: *See—*
Brown, Gregory J., 4,344,469, Cl. 141-90.000.
Fretz, Edward R., Jr.; and Green, Joseph, 4,345,059, Cl. 528-102.000.
Kondo, Kiyoshi; Takashima, Toshiyuki; and Suda, Minoru, 4,344,884, Cl. 549-273.000.
Lill, Melvin H.; and Roberts, Thomas E., Jr., 4,344,234, Cl. 33-228.000.
Pinsky, Michael L.; and Walden, John, 4,344,650, Cl. 299-4.000.
Sigal, Jacob, 4,344,716, Cl. 403-13.000.
Thompson, John S.; and Jadlocki, Joseph F., Jr., 4,344,977, Cl. 426-532.000.
Foley, James W.: *See—*
Cournoyer, Richard L.; and Foley, James W., 4,345,017, Cl. 430-221.000.
Foley, Thomas J.: *See—*
Louderback, Allan L.; and Foley, Thomas J., 4,344,864, Cl. 252-408.000.
Folkenroth, Richard P.; and Dunn, Thomas J., to Dentsply Research & Development Corp. Water recycler for dental operatories. 4,344,756, Cl. 433-92.000.
Forberg, Horst; and Achtnig, Klaus-Peter, to Krone GmbH. Overvoltage-arrester device for terminal- or junction blocks in telecommunication equipment. 4,345,294, Cl. 361-119.000.
Ford Motor Company: *See—*
Carriere, Donald L., 4,344,336, Cl. 74-690.000.
Forder, William C. F. Surgical retractor. 4,344,420, Cl. 128-20.000.
Forest Country Engineering Co.: *See—*
Dubey, Dennis, 4,344,470, Cl. 144-2.00Z.
Fortner, Suzanne M.: *See—*
Wielhouwer, Sandra L.; and Fortner, Suzanne M., 4,344,758, Cl. 433-137.000.
Fosnaugh, Jerry L.: *See—*
Lorette, Nicholas B.; and Fosnaugh, Jerry L., 4,344,916, Cl. 422-40.000.
Foster Wheeler Energy Corporation: *See—*
Stevens, William D., 4,344,388, Cl. 122-235.00R.
Zoschak, Robert J., 4,344,371, Cl. 110-229.000.
Fox, Irwin, to Fox, Irwin; Samuels, Alvin; and Samuels, David. Reactive iron oxide agents for scavenging hydrogen sulfide from hydrocarbon liquids. 4,344,842, Cl. 208-244.000.
Framatome: *See—*
Yazidjian, Jean-Claude, 4,344,387, Cl. 122-34.000.
Franck, Guy C. J. L. G. G. M.: *See—*
Bolssens, Frans P. J.; Franck, Guy C. J. L. G. G. M.; and Dehertefelt, Henri, 4,344,212, Cl. 29-33.00F.
Frazier, Albert A., to Aladdin Industries, Incorporated. Pump dispensers for containers. 4,344,548, Cl. 222-209.000.
Frechou, Jerome; and Isambert, Gilles. Automatic machine for peeling hard-boiled eggs. 4,344,359, Cl. 99-580.000.
Fretz, Edward R., Jr.; and Green, Joseph, to FMC Corporation. Fire retardant epoxy resins containing 3-hydroxyalkylphosphine oxides. 4,345,059, Cl. 528-102.000.
Frey, Fred J. Office partition interconnector assembly. 4,344,475, Cl. 160-135.000.
Friebe, Heinz W.: *See—*
Haupt, Walter; Warncke, Heinz; Friebe, Heinz W.; and Reimold, Dieter, 4,344,320, Cl. 73-40.700.
Friedli, Hans R.; and Boriack, Clinton J., to Dow Chemical Company, The. Brominated cycloaliphatic (meth) acrylate compositions. 4,345,048, Cl. 525-192.000.
Fritz, Hans-Gerhard; and Scharrenbroich, Helmut, to Voith Fischer Kunststofftechnik GmbH & Co. KG. Injection stretch-blow molding apparatus for the manufacture of biaxially oriented hollow bodies from thermoplastic material. 4,344,749, Cl. 425-174.400.
Fritz, William E.; and Soddy, Thomas C., to Youngstown Steel Door Company, The. Railway hopper car gate anti-friction seal. 4,344,365, Cl. 105-282.00A.
Frommlet, Hubert: *See—*
Derschmidt, Hans; and Frommlet, Hubert, 4,344,739, Cl. 416-141.000.
Frontier, Inc.: *See—*
Ellingson, Hartley, 4,344,723, Cl. 406-53.000.
Frudakis, Rosalie. Game encouraging self-improvement. 4,344,625, Cl. 273-242.000.
Fuchs, Rainer; Naumann, Klaus; Lantzsch, Reinhard; Hagemann, Hermann; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating insects and acarids with 3-(2-chloro-3,3,4,4,4-pentafluoro-1-butenyl)-2,2-dimethyl-cyclopropanecarboxylic acid esters. 4,344,960, Cl. 424-282.000.
Fuchs, Rainer; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Pesticidally active 2-phenyl-alk-1-enyl-cyclopropane-carboxylic acid esters. 4,344,963, Cl. 424-304.000.

Fuelsaver Company: *See*—
Bailey, Frank W., 4,344,479, Cl. 165-109.00R.

Fuji Photo Film Co., Ltd.: *See*—
Hirano, Shigeo; and Sakanoue, Kei, 4,345,024, Cl. 430-382.000.
Takahashi, Osamu; Ohki, Nobutaka; and Aoki, Kozo, 4,345,016, Cl. 430-214.000.
Tokuda, Kanji, 4,344,708, Cl. 356-404.000.
Yagihara, Morio; and Yokota, Yukio, 4,345,025, Cl. 430-385.000.

Fujihara, Youji; Shiba, Masami; Hazama, Toshio; and Kito, Shozo, to Daihatsu Motor Co., Ltd.; and Kabushiki Kaisha Tokai Rika Denki Seisakusho. Electric switch apparatus for automobile power train clutch. 4,344,514, Cl. 192-3.580.

Fujii, Takao: *See*—
Nagura, Kenji; Takeda, Shinichi; Namie, Koshi; Fujii, Takao; Yamamoto, Michio; and Yokoyama, Seiichi, 4,345,089, Cl. 560-77.000.

Fujinaga, Katsumi: *See*—
Yoshikawa, Yoshihiro; Katabami, Takao; Fujinaga, Katsumi; and Kobayashi, Yoshiaki, 4,344,327, Cl. 73-626.000.

Fujinami, Shosaku: *See*—
Ishii, Yoshiaki; Kume, Tsutomu; Ando, Naoyoshi; and Fujinami, Shosaku, 4,344,373, Cl. 110-347.000.

Fujioka, Yoshiki: *See*—
Kohzai, Yoshinori; Fujioka, Yoshiki; and Ota, Naoto, 4,345,192, Cl. 318-592.000.

Fujisawa, Tetsuo; and Tanioka, Takashi, to Kabushiki Kaisha Kobe Seiko Sho. Cyclone separator with influent guide blade. 4,344,538, Cl. 209-144.000.

Fujita, Kenji; Korehisa, Kazuo; Asaba, Hirosi; Harada, Hideo; and Shibuya, Tsuneo, to Sumitomo Heavy Industries, Ltd. Apparatus for cleaning door frames of coke ovens. 4,344,204, Cl. 15-93.00A.

Fujitsu Fanuc Limited: *See*—
Kohzai, Yoshinori; Fujioka, Yoshiki; and Ota, Naoto, 4,345,192, Cl. 318-592.000.

Fujitsu Limited: *See*—
Hirotani, Tatsushi; and Nagata, Satoshi, 4,345,316, Cl. 364-900.000.
Yoneda, Yasuhiro; Kitakohji, Toshisuke; and Kitamura, Kenro, 4,345,020, Cl. 430-270.000.

Fujiwara, Tatsuro: *See*—
Sakakibara, Hideo; Fujiwara, Tatsuro; Okegawa, Osamu; Honda, Eiichi; Watanabe, Susumu; and Matsuda, Tetsuo, 4,345,069, Cl. 536-7.100.

Fujiwara, Toshitaka; Nabeta, Teiichi; Akita, Sigeyuki; and Kitagawa, Junji, to Nippon Soken, Inc.; and Nippondenso Co., Ltd. Apparatus responsive to the amount of refrigerant flow in a refrigerant flow in a refrigerant circulating system. 4,344,293, Cl. 62-126.000.

Fukuda, Kyohei, to Hitachi, Ltd. Color picture tube with magnetic focusing system. 4,345,183, Cl. 313-412.000.

Fukuhara, Kunio: *See*—
Ueno, Fumito; and Fukuhara, Kunio, 4,344,297, Cl. 62-196.00C.

Fukuto, Tetsuo R.: *See*—
Fahmy, Mohamed A. H.; and Fukuto, Tetsuo R., 4,344,883, Cl. 549-467.000.

Fukuyama, Keiji: *See*—
Saito, Masato; Tsuchihashi, Michihiro; Takai, Yoshinori; Fukuyama, Keiji; and Watanabe, Keiji, 4,345,186, Cl. 315-49.000.

Fulop, Gabor F.; Betz, Jacob F.; Meyers, Peter V.; and Doty, Mitchell E., to Ametek, Inc. Cadmium telluride photovoltaic cells. 4,345,107, Cl. 136-255.000.

Furukawa Electric Co., Ltd., The: *See*—
Sugata, Shigeo; Tachigami, Shigeru; Kikkawa, Satoru; Umezu, Haruo; and Ohkubo, Masanori, 4,345,112, Cl. 174-107.000.

Furumaki, Naoyuki: *See*—
Miki, Isao; Kishihara, Takeshi; Kawai, Toshiyuki; and Furumaki, Naoyuki, 4,344,477, Cl. 164-98.000.

Furuta, Kenzi: *See*—
Kanayama, Katsumi; Furuta, Kenzi; and Motoyama, Kazuyasu, 4,345,286, Cl. 360-137.000.

Futere, Albert L.; and Kelly, Michael J. Limb protector for athletes. 4,344,189, Cl. 2-16.000.

Fyles, Kenneth M.; and Shorrock, Peter, to Pilkington Brothers Limited. Alkali resistant glass fibres for cement reinforcement. 4,345,037, Cl. 501-38.000.

G. D Societa per Azioni: *See*—
Seragnoli, Enzo, 4,344,445, Cl. 131-282.000.

GAF Corporation: *See*—
Schneider, Louis; Graham, David E., deceased; and Fidelity Union Trust Company, Executor, 4,344,788, Cl. 71-76.000.

Gago, Ignace; and Coppens, Guillaume, to Interox (Societe Anonyme). Process for the preparation of coated seeds. 4,344,979, Cl. 427-4.000.

Gail, Heinz: *See*—
Ganseuer, Horst; Remus, Dieter; and Gail, Heinz, 4,344,605, Cl. 266-48.000.

Gailey, J. Lynn: *See*—
Wollam, Carl A.; Gailey, J. Lynn; and Chalmers, Alexander A., 4,344,990, Cl. 427-286.000.

Gallagher, John P., Jr., to Trane Company, The. Water-in-oil emulsifier and oil-burner boiler system incorporating such emulsifier. 4,344,752, Cl. 431-354.000.

Galos, Imre, to Advance Valve Installations. Apparatus for plugging a pressure piping system. 4,344,460, Cl. 138-89.000.

Gandini, Marco; and Viale, Ernesto, to Cselt-Centro Studi e Laboratori Telecomunicazioni S.p.A. Message-interchange circuitry for microprocessors linked by synchronous communication network. 4,345,325, Cl. 370-29.000.

Gangluff, Joseph A.; and Charton, Wayne F. Heavy duty seedling planter. 4,344,374, Cl. 111-2.000.

Ganseuer, Horst; Remus, Dieter; and Gail, Heinz, to Siemag Transplan GmbH. Apparatus for cutting the end off a coiled strip. 4,344,605, Cl. 266-48.000.

Garbutt, John T., to Grain Processing Corporation. Preservation of fruits and vegetables. 4,344,971, Cl. 426-102.000.

Gardner, James J. Steam powered stove. 4,344,569, Cl. 237-12.100.

Garetti, Enzo: *See*—
Bernardini, Vincenzo; Garetti, Enzo; and Manfreddi, Renato, 4,345,319, Cl. 365-210.000.

Garrett Corporation, The: *See*—
Liu, Hsin-Tuan, 4,344,737, Cl. 415-199.100.

Garroway, Allen N.: *See*—
Bertrand, Richard D.; Chingas, Gerard C.; Garroway, Allen N.; and Moniz, William B., 4,345,207, Cl. 324-308.000.

Garvin, George R., to Sam Garvin & Company. Method for the manufacture of washers and the like. 4,344,342, Cl. 83-45.000.

Gasaver Corp.: *See*—
Minor, Robert N.; and Cloutier, Edward J. F., 4,344,406, Cl. 123-587.000.

Gaskins, Jack C.: *See*—
Christian, Charlie R.; Gaskins, Jack C.; Hamrick, Jack; and Reed, Norman L., 4,344,211, Cl. 28-183.000.

Gasparrini, Charles R.: *See*—
MacPhee, John; Gasparrini, Charles R.; and Arnolds, Karlheinz E. H., 4,344,361, Cl. 101-425.000.

Gaudette, Andrew J.; Dana, Dave A.; and Haney, Donald, to Cotton Machinery Company, Inc. Combined cotton module builder and seed cotton trash extractor. 4,344,272, Cl. 56-16.600.

Gaul, James M.; and Nguyen, Tinh, to Atlantic Richfield Company. Organic polyisocyanate-dialkyl carbonate adhesive binder compositions. 4,344,798, Cl. 106-123.0LC.

Gauthier, Francis: *See*—
Mignien, Georges; and Gauthier, Francis, 4,345,137, Cl. 219-121.0PK.

Gautier, Bernard, to Societe Francaise d'Equipements pour la Navigation Aerienne. Aircraft flight control process and device. 4,345,310, Cl. 364-429.000.

Gazdac, Maria: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Dancsi, Lajos; Keve, Tibor; and Gazdac, Maria, 4,345,082, Cl. 546-51.000.

Gazdag, Maria: *See*—
Nagy, Geza T.; Szepesi, Gabor; and Gazdag, Maria, 4,344,950, Cl. 424-262.000.

Gearco Limited: *See*—
Jerry, James H.; and Dickie, Ira A., 4,344,501, Cl. 180-253.000.

Geary, William C.: *See*—
Heydrich, Hans; Woods, Melvin E.; and Geary, William C., 4,344,390, Cl. 123-41.82A.

Gebruder Buhler AG: *See*—
Seiler, Werner, 4,344,975, Cl. 426-285.000.

Geiger, Istvan; and Theuerkauf, Heinz, to Volkswagenwerk Aktiengesellschaft. Method for operation of a spark-ignited internal combustion engine and arrangement for execution of the method. 4,344,397, Cl. 123-339.000.

Gelbard, Robert B., to General Electric Company. Thermal delay demand defrost system. 4,344,294, Cl. 62-155.000.

Gellert, Jobst U. Edge gated injection molding system with hollow seals. 4,344,750, Cl. 425-548.000.

General Battery Corporation: *See*—
Oxenreider, Terry; and Eberle, William J., 4,344,748, Cl. 425-143.000.

General Dynamics, Pomona Division: *See*—
Golden, Michael D., 4,344,350, Cl. 89-33.00E.

General Electric Company: *See*—
Alley, Robert P.; and Tompkins, Russell E., 4,345,229, Cl. 336-83.000.
Bedard, James F.; Eichelberger, Charles W.; and Nati, Salvatore F., Jr., 4,345,200, Cl. 323-350.000.
Brunelle, Daniel J., 4,345,062, Cl. 528-198.000.
Dolce, Thomas J., 4,344,878, Cl. 524-409.000.
Eichelberger, Charles W.; and Wojnarowski, Robert J., 4,345,236, Cl. 338-176.000.
Fahy, William J.; and Luborsky, Fred E., 4,345,007, Cl. 428-679.000.
Flanders, Thomas E., 4,344,235, Cl. 33-366.000.
Gelbard, Robert B., 4,344,294, Cl. 62-155.000.
Glugla, Paul G., 4,345,010, Cl. 429-197.000.
Grahame, Frederick W., 4,345,298, Cl. 361-273.000.
Harmon, Larry R., 4,345,135, Cl. 219-10.55B.
Howell, Edward K., 4,345,289, Cl. 361-45.000.
Jones, Donald W., 4,345,175, Cl. 310-45.000.
Lenzing, Richard S., 4,345,224, Cl. 335-132.000.
Loucks, George R., 4,345,050, Cl. 525-390.000.
Loucks, George R., 4,345,051, Cl. 525-390.000.
Norwood, Richard L., 4,345,145, Cl. 219-492.000.
Olson, Daniel R., 4,344,830, Cl. 204-159.160.
Owyang, King, 4,345,266, Cl. 357-34.000.
Stark, Charles J., 4,344,887, Cl. 549-531.000.
Summey, Samuel T., 4,345,306, Cl. 362-294.000.
Wolfinger, John F., 4,345,198, Cl. 322-25.000.

General Instrument Corporation: *See—*
Mouyard, Arthur A.; Hamby, Michael V.; and Tomaszek, Paul A., 4,345,308, Cl. 362-332.000.
General Motors Corporation: *See—*
Nagy, Louis L.; and Myers, Mark E., Jr., 4,345,202, Cl. 324-58.50B.
Voss, Richard J., 4,345,199, Cl. 322-28.000.
Wheadon, Ellis G.; and Nowakowski, Robert J., 4,345,197, Cl. 320-6.000.
Genini, Maurice: *See—*
Aubert, Jean-Paul; and Genini, Maurice, 4,344,462, Cl. 138-130.000.
Genth, Hermann: *See—*
Kuhle, Engelbert; Paulus, Wilfried; Genth, Hermann; and Brandes, Wilhelm, 4,344,962, Cl. 424-300.000.
George, Delbert L.: *See—*
Healey, Daniel P., Jr.; and George, Delbert L., 4,344,808, Cl. 156-166.000.
Gerard, Roland; Brun, Norbert; and Ricard, Jacques, to Cibie Projecteurs. Optical systems permitting controlled shifting of the beam pattern in headlamps, especially for vehicles. 4,345,303, Cl. 362-80.000.
Gerdes, John H., Jr., to Bethlehem Steel Corporation. Method of determining coke level. 4,344,819, Cl. 201-1.000.
Gerlach, Robert L., to Perkin-Elmer Corporation, The. Magnetic lens. 4,345,152, Cl. 250-396.0ML.
Gerrick, Richard L. Portable golf ball washer. 4,344,203, Cl. 15-21.00A.
Getto, Elmar: *See—*
Widder, Rudi; Getto, Elmar; and Hettche, Albert, 4,344,862, Cl. 252-391.000.
Gewerkschaft Eisenhutte Westfalia: *See—*
Redemann, Richard, 4,344,581, Cl. 241-88.400.
Giersch, Robert V. C., to Edward Weck & Company, Inc. Hemostatic clip cartridge. 4,344,531, Cl. 206-339.000.
Gies, Johannes, to Siemens Aktiengesellschaft. Transistor switch with two control inputs. 4,345,164, Cl. 307-255.000.
Giggi, Robert A.: *See—*
Arulpragasam, Jega A.; Giggi, Robert A.; Lary, Richard F.; and Sullivan, Daniel T., 4,345,309, Cl. 364-200.000.
Giglia, Robert D., to American Cyanamid Company. Electrochromic display device with improved erasing characteristic. 4,344,674, Cl. 350-357.000.
Gilden, Meyer: *See—*
Grudkowski, Thomas W.; and Gilden, Meyer, 4,345,176, Cl. 310-313.00A.
Gillette Company, The: *See—*
Tolgyesi, Eva; and Bresak, Ann F., 4,344,763, Cl. 8-127.510.
Gilmore, William J., to Acco Industries Inc. Self-adjusting cable conduit mechanism. 4,344,518, Cl. 192-111.00A.
Gilson, James J.; and Barrett, Richard B. Construction of nozzle. 4,344,577, Cl. 239-546.000.
Gleinig, Harald: *See—*
Lahrs, Jurgen; Schubert, Klaus; Gosling, Claus; Jovcic, Dorde; Gleinig, Harald; and Skerhut, Reiner, 4,344,766, Cl. 8-524.000.
Glen, James M.: *See—*
Easton, Ian A.; Glen, James M.; and Kieran, Ann G., 4,344,967, Cl. 424-359.000.
Glugla, Paul G., to General Electric Company. Electrolyte for secondary electrochemical cell. 4,345,010, Cl. 429-197.000.
Godai, Tomokazu; Minato, Shoji; Nishimura, Katushi; and Ogawa, Tsuneshi, to Kobe Steel, Ltd. Composite wire for stainless steel welding. 4,345,140, Cl. 219-146.230.
Goedecke, Ralf; Hofen, Willi; Seifert, Hermann; and Siekmann, Gerd, to Bayer Aktiengesellschaft. Process for the preparation of percarboxylic acid solutions. 4,344,897, Cl. 260-502.00R.
Gohlke, Daniel J., to W. L. Gore & Associates, Inc. Breathable laminate. 4,344,999, Cl. 428-212.000.
Gold, Charles D.: *See—*
Gold, Henry O.; and Gold, Charles D., 4,344,755, Cl. 433-76.000.
Gold, Henry O.; and Gold, Charles D. Dental handpiece guide. 4,344,755, Cl. 433-76.000.
Golden, Michael D., to General Dynamics, Pomona Division. Crossfeeder. 4,344,350, Cl. 89-33.00E.
Golden Skillet Corporation: *See—*
Craig, Ernest M.; and Minor, John M., 4,345,143, Cl. 219-411.000.
Goldfarb, Adolph E.; and Dantzer, Elonne. Play set. 4,344,249, Cl. 46-151.000.
Goldsmith, Riley G., to Conoco Inc. Multiple anchors for a tension leg platform. 4,344,721, Cl. 405-224.000.
Goodman, Alvin M.; and Tarng, Ming L., to RCA Corporation. Method of passivating a semiconductor device with a multi-layer passivant system by thermally growing a layer of oxide on an oxygen doped polycrystalline silicon layer. 4,344,985, Cl. 427-85.000.
Gordon, Harry W., to Del Laboratories, Inc. Nail cleanser. 4,344,932, Cl. 424-61.000.
Gosling, Claus: *See—*
Lahrs, Jurgen; Schubert, Klaus; Gosling, Claus; Jovcic, Dorde; Gleinig, Harald; and Skerhut, Reiner, 4,344,766, Cl. 8-524.000.
Gotberg, John P. Drawer associating constructions. 4,344,661, Cl. 312-330.00R.
Goth, James: *See—*
Goth, John, 4,344,642, Cl. 280-682.000.
Goth, John, to Goth, John; and Goth, James, a part interest. Vehicle axle mounting arrangement. 4,344,642, Cl. 280-682.000.
Goto, Yasuo: *See—*
Murata, Tomoji; Goto, Yasuo; and Hayashi, Masamichi, 4,344,696, Cl. 355-8.000.
Gotzenberger, Rudibert, to Ernst Flitsch GmbH & Co. Thermostatic expansion valve. 4,344,566, Cl. 236-92.00B.
Gould Inc.: *See—*
Magnuson, Ruel D., 4,344,564, Cl. 236-34.500.
Grabmaier, Josef: *See—*
Schneider, Hartmut; and Grabmaier, Josef, 4,345,180, Cl. 313-221.000.
Graefe, Richard J.: *See—*
Kampf, Julian C.; Graefe, Richard J.; and Profio, Mark V., 4,345,288, Cl. 361-31.000.
Graf, Harlan G.; Janssen, Harry R.; and Edwards, Don L., to Conoco Inc. Water cooled vertical gas distributor. 4,344,754, Cl. 432-233.000.
Graham, David E., deceased: *See—*
Schneider, Louis; Graham, David E., deceased; and Fidelity Union Trust Company, Executor, 4,344,788, Cl. 71-76.000.
Grahame, Frederick W., to General Electric Company. Modified round roll capacitor and method of making. 4,345,298, Cl. 361-273.000.
Grain Processing Corporation: *See—*
Garbutt, John T., 4,344,971, Cl. 426-102.000.
Gram, Knud F. Sail craft. 4,344,377, Cl. 114-103.000.
Grange, Andre A.; and Corbe, Jean A., to Societe Nationale des Poudres et Explosifs. Process and apparatus for manufacturing filaments of a refractory material by high-frequency heating. 4,344,983, Cl. 427-46.000.
Grant, Duane E.; and Walker, James R., to International Business Machines Corporation. Zonal concentrator for accurate erasure of photoconductor charge. 4,344,691, Cl. 355-1.000.
Grasso, Albert P.; and Lane, John W., to United Technologies Corporation. Fuel cell power plant self-controlling coolant cleaning process. 4,344,849, Cl. 210-662.000.
Grasso, Albert P., to United Technologies Corporation. Fuel cell power plant coolant cleaning system and method. 4,344,850, Cl. 210-664.000.
Gray, Paul D., to Magnex Limited. Collapsible structure and method of building using such a structure. 4,344,266, Cl. 52-742.000.
Gray, Richard L., to Reliance Universal, Inc. Water-borne topcoat spray method. 4,344,991, Cl. 427-325.000.
Great Lakes Chemical Corporation: *See—*
Smith, Ray E.; Shukla, Jayendra G.; and Nicholson, Richard R., 4,345,002, Cl. 428-288.000.
Green, James A., II: *See—*
Young, Donald C.; and Green, James A., II, 4,345,099, Cl. 564-63.000.
Green, Joseph: *See—*
Fretz, Edward R., Jr.; and Green, Joseph, 4,345,059, Cl. 528-102.000.
Green, Norman F.; and Wilda, Douglas W., to Honeywell Inc. Fluid pressure sealing ring for a valve. 4,344,632, Cl. 277-152.000.
Green, Walter L., to United States of America, Energy. Control system to reduce the effects of friction in drive trains of continuous-path-positioning systems. 4,345,194, Cl. 318-621.000.
Greenhalgh, John L.: *See—*
Bancroft, John; Greenhalgh, John L.; and Smith, Ronald, 4,344,525, Cl. 198-499.000.
Greenwald, Richard B.: *See—*
Borror, Alan L.; and Greenwald, Richard B., 4,345,018, Cl. 430-234.000.
Greer, Douglas S.; and Grunewald, Paul, to Burroughs Corporation. Video output circuit for high resolution character generator in a digital display unit. 4,345,244, Cl. 340-728.000.
Greer Hydraulics, Incorporated: *See—*
Zahid, Abduz, 4,344,458, Cl. 138-30.000.
Gref, Hans, to Agfa-Gevaert AG. Independent drive for a roller cavity suction apparatus. 4,344,552, Cl. 226-95.000.
Grenet, Edouard P. Process for obtaining energy, soft water and by-products from aqueous substances. 4,344,847, Cl. 210-600.000.
Gries, Robert J.; Miko, Sandor; and Conn, Calvin E., to RCA Corporation. Television receiver high frequency regulated power supply including a low voltage ferroresonant transformer coupled to a step-up high voltage transformer. 4,345,188, Cl. 315-411.000.
Griffith, Carl D.; and Oliver, Kenneth L., to Sperry Corporation. Strapdown multifunction servoactuator apparatus for aircraft. 4,345,195, Cl. 318-628.000.
Grimmett, Christopher M.: *See—*
Sharpe, Frederick R.; Grimmett, Christopher M.; and Laws, Derek R. J., 4,344,978, Cl. 426-600.000.
Grinnell Lithographic Co., Inc.: *See—*
Olsen, Peter R., 4,344,533, Cl. 206-459.000.
Groszstuck, Werner, to Nustep Trenndusen Entwicklungs- und Patentverwertungsgesellschaft mbH & Co. KG. Apparatus for the separation of fluids. 4,344,780, Cl. 55-347.000.
Groszstuck, Werner, to Nustep Trenndusen Entwicklungs- und Patentverwertungsgesellschaft mbH & Co. KG. Apparatus for the separation of fluid mixtures into components of different mass. 4,344,782, Cl. 55-397.000.
Grote, Hugo; Hasselmann, Heinz; Kunze, Volkmar; Zacharias, Karl; Kuelpmann, Robert; and Mueller, Paul, to Mannesmann DeMag AG. Claw clutch. 4,344,515, Cl. 192-67.00R.
Groth, Thomas: *See—*
Batty, Mark J.; and Groth, Thomas, 4,344,994, Cl. 428-41.000.
Grudkowski, Thomas W.; and Gilden, Meyer, to United Technologies Corporation. Temperature compensated gallium arsenide surface acoustic wave devices. 4,345,176, Cl. 310-313.00A.
Grunewald, Paul: *See—*
Greer, Douglas S.; and Grunewald, Paul, 4,345,244, Cl. 340-728.000.

GTE Products Corporation: *See—*
Becker, Jon; Miller, G. Kirby; and Burney, Charles F., 4,344,810, Cl. 156-379.700.
Pappas, John A.; and Hebert, Roger T., 4,345,178, Cl. 313-113.000.
Seidel, Heinz H., 4,344,725, Cl. 407-114.000.
Guilchier, Bernard: *See—*
Ognier, Paul; and Guilchier, Bernard, 4,344,663, Cl. 339-75.00M.
Gulf States Manufacturers, Inc.: *See—*
Watkins, Neil A.; and Richardson, Clayton H., Jr., 4,344,413, Cl. 126-429.000.
Gunther, John E.; Lichty, William R.; and Hoffman, William C., to Hughes Aircraft Company. Fiber optic light traps for electro-optical display devices. 4,344,668, Cl. 350-96.270.
Gupton, John E.; and Shim, Norman, to Baxter Travenol Laboratories, Inc. Bubble detector with feedback circuit for improved sensitivity. 4,344,429, Cl. 128-214.00R.
Gustafson, Hans H. Bed having two mutually displaceable frames for wall side access. 4,344,195, Cl. 5-11.000.
Gustav Georg Veith GmbH & Co., KG.: *See—*
Veith, Gustav G., 4,344,363, Cl. 104-162.000.
Gutierrez, Antonio; Brois, Stanley J.; Ryer, Jack; and Deen, Harold E., to Exxon Research & Engineering Co. Functional fluid containing metal salts of esters of hydrocarbyl succinic acid or anhydride with thio-bis-alkanols as antioxidants. 4,344,853, Cl. 252-33.600.
Gutierrez Atencio, Francisco J. Hydropowered bulkhead. 4,345,159, Cl. 290-43.000.
Haapamaki, Pertti, to Rauma-Repola Oy. Slurry measuring apparatus. 4,344,321, Cl. 73-61.400.
Haas, Gustav: *See—*
Archenholtz, Ake; Caisander, Yngve; and Haas, Gustav, 4,344,652, Cl. 299-70.000.
Haas, Roger A.: *See—*
Seppala, Lynn G.; and Haas, Roger A., 4,345,212, Cl. 330-4.300.
Haase, Thomas A.: *See—*
Pesa, Frederick A.; and Haase, Thomas A., 4,344,866, Cl. 252-428.000.
Haberle, Friedrich: *See—*
Kress, Dieter; and Haberle, Friedrich, 4,344,724, Cl. 407-36.000.
Habicht, Ernst; Ferrini, Pier G.; and Sallmann, Alfred, to Ciba-Geigy Corporation. Benz-acyl-benzimidazole derivatives and antiallergic compositions. 4,344,957, Cl. 424-273.00B.
Haes, Freddy; Reynhout, Cornelis M.; Hermes, Guillaume M. P. G.; and Boiten, Ebbe, to U.S. Philips Corporation. Shaving apparatus. 4,344,228, Cl. 30-43.900.
Haga, Takahiro: *See—*
Nishiyama, Ryuzo; Haga, Takahiro; Toki, Tadaaki; Koyanagi, Tohru; and Murai, Shigeo, 4,344,951, Cl. 424-263.000.
Hagemann, Hermann: *See—*
Fuchs, Rainer; Naumann, Klaus; Lantzsch, Reinhard; Hagemann, Hermann; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,344,960, Cl. 424-282.000.
Hahnke, Manfred: *See—*
Mohr, Reinhard; and Hahnke, Manfred, 4,344,879, Cl. 260-146.00R.
Hake, Lewis W.: *See—*
Abbin, Joseph P., Jr.; Devaney, Howard F.; and Hake, Lewis W., 4,345,124, Cl. 200-61.530.
Hakulinen, Risto R., to Enso- Gutzeit Osakeyhtio . Procedure for purifying waste water in a floating layer reactor. 4,344,848, Cl. 210-617.000.
Hall, Dale R., to B. F. Goodrich Company, The. Stabilization of post-chlorinated vinyl chloride polymers by phosphate salts. 4,345,040, Cl. 521-53.000.
Halliburton Company: *See—*
Nickles, Stephen K.; and Beaird, Suzanne M. T., 4,344,364, Cl. 105-62.00R.
Halper, Barry J.: *See—*
Boyle, John F.; Halper, Barry J.; Link, James C.; and Mullane, John C., Jr., 4,344,290, Cl. 62-48.000.
Hamaker, Ralph A., to Xerox Corporation. Belt tracking system. 4,344,693, Cl. 355-3.0BE.
Hamby, Michael V.: *See—*
Mouyard, Arthur A.; Hamby, Michael V.; and Tomaszek, Paul A., 4,345,308, Cl. 362-332.000.
Hammann, Ingeborg: *See—*
Fuchs, Rainer; Naumann, Klaus; Lantzsch, Reinhard; Hagemann, Hermann; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,344,960, Cl. 424-282.000.
Fuchs, Rainer; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,344,963, Cl. 424-304.000.
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Hammann, Ingeborg; and Stendel, Wilhelm, 4,345,078, Cl. 544-244.000.
Stetter, Jorg; Homeyer, Bernhard; and Hammann, Ingeborg, 4,344,953, Cl. 424-269.000.
Hammer, Jeffrey M.; and Olson, Thomas J., to Honeywell Inc. Method and apparatus for power load shedding. 4,345,162, Cl. 307-39.000.
Hammer, Robert H., to Boeing Company, The. Hybrid composite structures. 4,344,995, Cl. 428-61.000.
Hammer, Thomas: *See—*
Viehrig, Wolfgang; Osegowitsch, Viktor; and Hammer, Thomas, 4,344,690, Cl. 354-319.000.
Hamon Sobelco, S.A.: *See—*
Monjoie, Michel W. J. P. R., 4,344,899, Cl. 261-112.000.
Hamrick, Jack: *See—*
Christian, Charlie R.; Gaskins, Jack C.; Hamrick, Jack; and Reed, Norman L., 4,344,211, Cl. 28-183.000.
Hancock, Dane R.; and Rand, Burgess F. Pipe joint sealed test method. 4,344,319, Cl. 73-40.50R.
Haneishi, Yasuyuki: *See—*
Kohmoto, Shinsuke; and Haneishi, Yasuyuki, 4,344,689, Cl. 354-286.000.
Haney, Donald: *See—*
Gaudette, Andrew J.; Dana, Dave A.; and Haney, Donald, 4,344,272, Cl. 56-16.600.
Hansen, Walter I.: *See—*
Vella, Louis C.; and Hansen, Walter I., 4,345,245, Cl. 340-744.000.
Hanyu, Susumu; Tonomura, Yoshinobu; and Watanabe, Kazuo, to Janome Sewing Machine Co., Ltd. Speed control device for sewing machines. 4,345,196, Cl. 318-812.000.
Hara, Kazuyuki, to Ricoh Co. Ltd. Carriage support for recording head, diode matrix, and drivers. 4,345,264, Cl. 346-154.000.
Hara, Toshitami: *See—*
Shirato, Yoshiaki; Takatori, Yasushi; Hara, Toshitami; Nishimura, Yukuo; and Takahashi, Michiko, 4,345,262, Cl. 346-140.00R.
Harada, Hideo: *See—*
Fujita, Kenji; Korehisa, Kazuo; Asaba, Hirosi; Harada, Hideo; and Shibuya, Tsuneo, 4,344,204, Cl. 15-93.00A.
Harford, Jack R., to RCA Corporation. Variable emitter degeneration gain-controlled amplifier. 4,345,214, Cl. 330-254.000.
Harman-Kardon, Incorporated: *See—*
Philips, Peter, 4,345,281, Cl. 360-66.000.
Harmer, George A., to Lucas Industries Limited. Friction lining wear indicators for shoe-drum brakes. 4,344,509, Cl. 188-1.110.
Harmon, Larry R., to General Electric Company. Delay-start arrangement for a microwave oven. 4,345,135, Cl. 219-10.55B.
Harnischfeger Corporation: *See—*
Rathi, Ram N.; and Nelson, Ronald E., 4,344,497, Cl. 180-41.000.
Harper-Wyman Company: *See—*
Bergquist, Frank H., 4,345,144, Cl. 219-413.000.
Harrell, Gordon E.: *See—*
Waters, E. Eugene; and Harrell, Gordon E., 4,344,505, Cl. 182-47.000.
Harris, William S., Jr., to Texas Instruments Incorporated. Adaptable nonlinear transmission line terminator. 4,345,171, Cl. 307-560.000.
Harsco Corporation: *See—*
Perisastry, Ayyala; Vishe, Richard A.; and Hoet, Peter J., 4,344,528, Cl. 206-3.000.
Hartmann, Heinrich: *See—*
Denzinger, Walter; Straub, Ferdinand; and Hartmann, Heinrich, 4,345,049, Cl. 525-339.000.
Hartwig, Siegfried: *See—*
Lerche, Ernst; Raschke, Bernward; and Hartwig, Siegfried, 4,345,237, Cl. 340-27.00R.
Harwood, William J., to Scapa Dryers, Inc. In-line clipper seam. 4,344,209, Cl. 24-31.00R.
Hasegawa, Junzo; Kawabata, Susumu; Yoshida, Kazunori; Suzuki, Fuzio; Itoh, Yusuke; Suzuki, Hajime; Arakawa, Hiroshi; and Kobayashi, Akira, to K.K. Toyoda Jidoshokki Seisakusho; and K.K. Toyota Chuo Kenkyusho. Method and apparatus for jetting auxiliary fluid in jet loom. 4,344,465, Cl. 139-435.000.
Hasegawa, Junzo; Kawabata, Susumu; Kono, Kiichi; and Inoue, Tetsuzo, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Flexible type rapier loom. 4,344,466, Cl. 139-449.000.
Haselkorn, Michael H., to Armco Inc. Stable slurry of inactive magnesia and method therefor. 4,344,802, Cl. 148-27.000.
Hasse, Peter; Wiesinger, Johannes; and Pivit, Erich, to Dehn + Sohne + Co. KG; and AEG-Telefunken Aktiengesellschaft. Arrester. 4,345,293, Cl. 361-117.000.
Hasse, Peter; Wiesinger, Johannes; and Pivit, Erich, to Dehn & Sohne & Co. KG; and Aeg-Telefunken Aktiengesellschaft. Arrester with spark gap. 4,345,295, Cl. 361-130.000.
Hasselman, Walter, Jr., to C.P. Chemical Co., Inc. Process for the preparation of phenol-urea-formaldehyde condensation products. 4,345,061, Cl. 528-161.000.
Hasselmann, Heinz: *See—*
Grote, Hugo; Hasselmann, Heinz; Kunze, Volkmar; Zacharias, Karl; Kuelpmann, Robert; and Mueller, Paul, 4,344,515, Cl. 192-67.00R.
Hata, Kosei, to Seikenkai. Cultivation of a deodorizing lactobacillus strain, storage thereof, and composition containing living cells thereof. 4,345,032, Cl. 435-253.000.
Hattori, Kyo: *See—*
Idogaki, Takaharu; Kawai, Hisasi; Matsui, Takeshi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,345,228, Cl. 335-222.000.
Hattori, Shinichiro, to Olympus Optical Co., Ltd. Data recording device. 4,344,682, Cl. 354-62.000.
Hattori, Tadashi; and Ueno, Yoshiki, to Nippon Soken, Inc. Air-fuel ratio detecting system. 4,344,317, Cl. 73-23.000.
Hattori, Yoshiyuki; Matsui, Kazuma; and Kinbara, Hiroji, to Nippon Soken, Inc. Power transmission device. 4,344,338, Cl. 74-752.00C.
Hauni-Werke Korber & Co. KG: *See—*
Hausler, Nikolaus; and Helms, Adolf, 4,344,382, Cl. 118-674.000.
Quarella, Guido, 4,344,526, Cl. 198-689.000.
Haupt, Walter; Warncke, Heinz; Friebe, Heinz W.; and Reimold, Dieter, to Bayer Aktiengesellschaft; and Rheinhold & Mahla GmbH. Crack indicator for monitoring the insulation of liquefied gas tanks. 4,344,320, Cl. 73-40.700.
Hausler, Nikolaus; and Helms, Adolf, to Hauni-Werke Korber & Co. KG. Apparatus for applying atomized plasticizer to a running tow of filamentary filter material. 4,344,382, Cl. 118-674.000.
Hawkins, Royal R., to Sundstrand Corporation. Frequency detector. 4,344,328, Cl. 73-651.000.

Hawley, Gil R., to Phillips Petroleum Company. Polymerization with titanium impregnated silica-chromium catalysts. 4,345,055, Cl. 526-96.000.

Hayashi, Masamichi: *See—*
Murata, Tomoji; Goto, Yasuo; and Hayashi, Masamichi, 4,344,696, Cl. 355-8.000.

Hayat, Victor. Electric toothbrush. 4,344,202, Cl. 15-4.000.

Hayden, Rodney, to TRW Inc. Push-on push-off switch. 4,345,227, Cl. 335-186.000.

Hazama, Toshio: *See—*
Fujihara, Youji; Shiba, Masami; Hazama, Toshio; and Kito, Shozo, 4,344,514, Cl. 192-3.580.

Healey, Daniel P., Jr.; and George, Delbert L. Method for manufacturing synthetic resin laminate tubing having a high bursting strength. 4,344,808, Cl. 156-166.000.

Heaton, William C. Internal combustion engine. 4,344,288, Cl. 60-595.000.

Hebert, Roger T.: *See—*
Pappas, John A.; and Hebert, Roger T., 4,345,178, Cl. 313-113.000.

Heck, Lyle D.: *See—*
Bulger, Gary A.; Heck, Lyle D.; Huttemann, Robert D.; Morabito, Joseph M.; Pitetti, Raymond C.; Unger, Burton A.; and Vallere, Donald J., 4,344,223, Cl. 29-577.00C.

Heemskerk, Rutgerus S.: *See—*
Vermeiren, Karel N.; Heemskerk, Rutgerus S.; and Dolfsma, Hendrik, 4,345,203, Cl. 324-61.00R.

Heidelberger Druckmaschinen Aktiengesellschaft: *See—*
Jeschke, Willi; and Junghans, Rudi, 4,344,360, Cl. 101-363.000.
Jeschke, Willi; and Muller, Hans, 4,344,610, Cl. 270-6.000.

Heim, Ulrich, to Dragerwerk Aktiengesellschaft. Arrangement for determining a medium. 4,345,151, Cl. 250-341.000.

Heinemann, Otto; and Schmits, Heinz-Herbert, to Krupp Polysius AG. Cyclone separator. 4,344,783, Cl. 55-459.00B.

Heisler, Raymond A. Apparatus for sensing, orientating and delivering cans to subsequent conveyor. 4,344,522, Cl. 198-419.000.

Heismann, Richard A., to Outboard Marine Corporation. Grass catcher bag. 4,344,274, Cl. 56-202.000.

Heit, Martin A.: *See—*
Vogt, Robert K.; and Heit, Martin A., 4,344,527, Cl. 198-781.000.

Heller, Rudolf; and Schindler, Walter, to Contraves AG. Auxiliary apparatus at a stand for an optical observation device. 4,344,595, Cl. 248-542.000.

Helms, Adolf: *See—*
Hausler, Nikolaus; and Helms, Adolf, 4,344,382, Cl. 118-674.000.

Hendriksma, Roelof R.; and VanRhijn, Wilhelmus J., to Oce-van der Grinten N.V. Dispersion-heat process for producing spherical electrophotographic toner powder including hydrophobic silica. 4,345,015, Cl. 430-137.000.

Henery, Vern A., to PPG Industries, Inc. Method of delivering powder coating reactants. 4,344,986, Cl. 427-180.000.

Henry, Richard K., to Owens-Corning Fiberglas Corporation. Sensing apparatus for pelletizing process. 4,344,747, Cl. 425-140.000.

Henville, Michael I., to Unimax Switch Limited. Snap action switches. 4,345,125, Cl. 200-67.00D.

Hercofina: *See—*
Nagura, Kenji; Takeda, Shinichi; Namie, Koshi; Fujii, Takao; Yamamoto, Michio; and Yokoyama, Seiichi, 4,345,089, Cl. 560-77.000.

Hercules Incorporated: *See—*
Miyata, Nobuyoshi; and Murase, Heihachi, 4,345,004, Cl. 428-416.000.

Hermann Berstorff Maschinenbau GmbH: *See—*
Koch, Klaus, 4,344,835, Cl. 208-8.00R.
Koch, Klaus, 4,344,836, Cl. 208-8.00R.

Hermanson, Lars, to Clark Door Company, Inc. Bracket and door track assembly. 4,344,206, Cl. 16-94.00R.

Hermes, Guillaume M. P. G.: *See—*
Haes, Freddy; Reynhout, Cornelis M.; Hermes, Guillaume M. P. G.; and Boiten, Ebbe, 4,344,228, Cl. 30-43.900.

Hermes Precisa International S.A.: *See—*
Clavel, Raymond, 4,344,714, Cl. 400-334.300.

Hernestam, Sven E. H.; Martinsson, Kjell B.; Christensson, Erik G.; and Olsson, Nils-Goran E., to AB Ferrosan. Method of treating diarrhoea with gamma-piperidino-butyrophenones. 4,344,952, Cl. 424-267.000.

Herring, Samuel H.: *See—*
Thompson, Charles E.; and Herring, Samuel H., 4,344,464, Cl. 139-383.00A.

Herrington, Fox J., to Mobil Oil Corporation. Method and apparatus providing uniform resin distribution in a coextruded product. 4,344,907, Cl. 264-173.000.

Herrmann, Gert, to Pierburg Luftfahrtgerate Union GmbH. Self-sealing gear pump with sealing pressure divider. 4,344,745, Cl. 418-132.000.

Herron, Lorne R., to Atlas Copco Aktiebolag. Rock drill boom structure. 4,344,599, Cl. 248-660.000.

Hester, Gerald P.: *See—*
Cadotte, Ernest R.; and Hester, Gerald P., 4,345,315, Cl. 364-900.000.

Hetschko, Manfred: *See—*
Hufnagel, Theobald; and Hetschko, Manfred, 4,345,074, Cl. 544-99.000.

Hettche, Albert: *See—*
Widder, Rudi; Getto, Elmar; and Hettche, Albert, 4,344,862, Cl. 252-391.000.

Heydrich, Hans; Woods, Melvin E.; and Geary, William C., to Cummins Engine Company, Inc. Piston-cylinder assembly of an internal combustion engine. 4,344,390, Cl. 123-41.82A.

Hicks, LaVern L.: *See—*
Hoshall, Thomas C.; Hicks, LaVern L.; and Renth, Larry, 4,344,580, Cl. 241-60.000.

Higashinaka, Hiroshi: *See—*
Kozono, Haruo; and Higashinaka, Hiroshi, 4,344,310, Cl. 72-225.000.

Higgins, Frank; Lautenshlager, Gilbert G.; and Bunn, Billy A., to United States Filter Corporation. Filter bag with protective cuff. 4,344,781, Cl. 55-379.000.

Higgins, Philip K., to Union Carbide Corporation. Constant current SCR power supply method and system for a welding load. 4,345,139, Cl. 219-137.0PS.

Hildreth, W. C. Automatic motorized fishing reel. 4,344,587, Cl. 242-106.000.

Hirano, Shigeo; and Sakanoue, Kei, to Fuji Photo Film Co., Ltd. Photographic development inhibitor releasing compound. 4,345,024, Cl. 430-382.000.

Hirano, Takashi, to Yamato Scale Co. Ltd. Automatic combination weighing machine with improved zero-point correction. 4,344,492, Cl. 177-25.000.

Hirose, Yasunori: *See—*
Matsumoto, Tadashi; Kuratani, Osamu; Hirose, Yasunori; and Toba, Susumu, 4,345,102, Cl. 568-678.000.

Hirotani, Tatsushi; and Nagata, Satoshi, to Fujitsu Limited. Shift arithmetic device. 4,345,316, Cl. 364-900.000.

Hirsch, Arthur E., to J. I. Case Company. Hydraulic control circuit for decelerating a swinging backhoe. 4,344,733, Cl. 414-694.000.

Hirsch, Hans J.; and Dannert, Horst, to U.S. Philips Corporation. Electrophotographic method of generating electrostatic images on two sides of an insulating foil. 4,345,012, Cl. 430-48.000.

Hirth, Emil, to Sybron Corporation. Lift mechanism for dental chair. 4,344,594, Cl. 248-421.000.

Hitachi, Ltd.: *See—*
Amada, Nobutaka; and Inoue, Shigeki, 4,345,215, Cl. 330-268.000.
Asai, Tadamichi; and Nakamura, Kousuke, 4,345,179, Cl. 313-136.000.
Fukuda, Kyohei, 4,345,183, Cl. 313-412.000.
Horiuchi, Michimasa; Ibamoto, Masahiko; and Rokutan, Hideaki, 4,345,190, Cl. 318-338.000.
Minakawa, Yoshimitsu; Ishibashi, Yoji; Sato, Isao; Uchiyama, Yoshihiro; and Takahashi, Kazuyoshi, 4,344,280, Cl. 60-39009.00F.
Miyakawa, Seii; Kawauchi, Akira; Iijima, Kazunori; Terayama, Takao; Yoshida, Masashi; and Kawase, Hideyuki, 4,345,282, Cl. 360-85.000.
Sawada, Hiroji; Igawa, Tatsuo; and Nagae, Hiromitsu, 4,345,120, Cl. 200-19.00R.
Suzuki, Mitsuo; Tokunaga, Takeshi; Yonekura, Seiji; Matsuoka, Shigeru; and Nakamura, Kenji, 4,344,252, Cl. 49-199.000.
Taki, Tomohiko, 4,344,741, Cl. 417-28.000.
Yasuye, Toshikazu; Kashioka, Seiji; and Shima, Yoshihiro, 4,345,312, Cl. 364-515.000.

Hitachi Medical Corporation: *See—*
Ishikawa, Isao; Kanda, Hiroshi; and Yamamoto, Shinji, 4,345,156, Cl. 250-385.000.

Hitachi Powdered Metals Company, Ltd.: *See—*
Endo, Hiroyuki; and Ikenoue, Yutaka, 4,344,795, Cl. 75-230.000.

Hjaeresen, Paul T., to F. L. Smidth & Co. Adjustable roller support for a rotary drum. 4,344,596, Cl. 248-550.000.

Ho, Roland K., to Motorola, Inc. Capacitive pressure transducer assembly with improved output lead design. 4,345,299, Cl. 361-283.000.

Hoag, Ethan D., to Locke Technology, Inc. Apparatus for generating an electric field. 4,345,331, Cl. 372-87.000.

Hoath, Grantley R.: *See—*
Bennett, David S.; and Hoath, Grantley R., 4,344,521, Cl. 198-404.000.

Hodogaya Chemical Co., Ltd.: *See—*
Kuroda, Akira; Nakamura, Tsutomu; and Onishi, Masatoshi, 4,345,042, Cl. 521-112.000.

Hoechst Aktiengesellschaft: *See—*
De Felice, Wilfried, 4,344,573, Cl. 239-320.000.
Mohr, Reinhard; and Hahnke, Manfred, 4,344,879, Cl. 260-146.00R.
Reinhardt, Friedrich; and Schmidt, Helmut, 4,344,765, Cl. 8-471.000.
Voetz, Franz J., 4,344,797, Cl. 106-84.000.

Hoefle, Milton L.; and Klutchko, Sylvester, to Warner-Lambert Company. Substituted acyl derivatives of 1,2,3,4-tetrahydroisoquinoline-3-carboxylic acids. 4,344,949, Cl. 424-258.000.

Hoesch Werke Aktiengesellschaft: *See—*
Arendt, Hans F.; and Hoffmann, Ernst H., 4,344,198, Cl. 8-158.000.

Hoet, Peter J.: *See—*
Perisastry, Ayyala; Vishe, Richard A.; and Hoet, Peter J., 4,344,528, Cl. 206-3.000.

Hofen, Willi: *See—*
Goedecke, Ralf; Hofen, Willi; Seifert, Hermann; and Siekmann, Gerd, 4,344,897, Cl. 260-502.00R.

Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating arthropods with O-alkyl-O-[5-carbalkoxy-7-alkyl-pyrazolo(1,5-α)-pyrimidin-2-yl]-(thiono) (thiol)-phosphoric (phosphonic) acid esters. 4,345,078, Cl. 544-244.000.

Hoffman, John J., to Jackel, Inc. Reinforced plastic tank. 4,344,543, Cl. 220-1.00B.

Hoffman, William C.: *See*—
Gunther, John E.; Lichty, William R.; and Hoffman, William C., 4,344,668, Cl. 350-96.270.
Hoffmann, Ernst H.: *See*—
Arendt, Hans F.; and Hoffmann, Ernst H., 4,344,198, Cl. 8-158.000.
Hoffmann-La Roche Inc.: *See*—
Chan, Ka-Kong; Holland, George W.; and Rosen, Perry, 4,345,084, Cl. 548-237.000.
Hoki, Tsuneo; and Matsuki, Yutaka, to Asahi-Dow Limited. Foaming synthetic resin compositions stabilized with N-(higher alkyl) C_1–C_8 amides. 4,345,041, Cl. 521-94.000.
Holden, Thomas F.: *See*—
Davis, Kirk E.; and Holden, Thomas F., 4,344,854, Cl. 252-45.000.
Holdridge, David W., to Swedlow, Inc. Focusing reflector. 4,344,673, Cl. 350-292.000.
Holland Company: *See*—
Chierici, Osvaldo F., 4,344,541, Cl. 213-61.000.
Holland, George W.: *See*—
Chan, Ka-Kong; Holland, George W.; and Rosen, Perry, 4,345,084, Cl. 548-237.000.
Holland, R. B.: *See*—
Hooper, Homer; and Holland, R. B., 4,344,218, Cl. 29-516.000.
Holland, Robert M. Adapter for photographic enlarger and method of attaching same. 4,344,702, Cl. 355-67.000.
Hollick, John G.: *See*—
Bouzianis, George J.; Hollick, John G.; McIlvin, Donald B.; and Sillars, Frederick S., 4,344,199, Cl. 12-54.300.
Hollowell, William; Tanaka, Akira; Ziv, Avraham; and Stamboulian, Nazareth, to American Safety Equipment Corp. Seat belt retractor assembly with post emergency spool release. 4,344,588, Cl. 242-107.40A.
Holmes, Frederick H., to British Aerospace. Torque shaft coupling. 4,344,305, Cl. 464-169.000.
Holoff, Manning; and Riggins, James D., to Manning Holoff Co. Tape dispenser. 4,344,813, Cl. 156-527.000.
Holsworth, Richard M.: *See*—
Provder, Theodore; Holsworth, Richard M.; and Koehler, Mark E., 4,344,709, Cl. 356-445.000.
Homeyer, Bernhard: *See*—
Fuchs, Rainer; Naumann, Klaus; Lantzsch, Reinhard; Hagemann, Hermann; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,344,960, Cl. 424-282.000.
Fuchs, Rainer; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,344,963, Cl. 424-304.000.
Stetter, Jorg; Homeyer, Bernhard; and Hammann, Ingeborg, 4,344,953, Cl. 424-269.000.
Honda, Eiichi: *See*—
Sakakibara, Hideo; Fujiwara, Tatsuro; Okegawa, Osamu; Honda, Eiichi; Watanabe, Susumu; and Matsuda, Tetsuo, 4,345,069, Cl. 536-7.100.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Iizuka, Yoshitoku; and Ohkubo, Kiyokazu, 4,344,561, Cl. 233-24.000.
Kurata, Noboru; Miyazaki, Kunio; and Yamamoto, Kuniyuki, 4,344,500, Cl. 180-230.000.
Honda, Tadatoshi: *See*—
Asano, Shiro; Shizuka, Kohei; Kambara, Yoshihiko; Mikami, Junji; Kato, Hiroshi; and Honda, Tadatoshi, 4,345,101, Cl. 564-206.000.
Honeywell Inc.: *See*—
Green, Norman F.; and Wilda, Douglas W., 4,344,632, Cl. 277-152.000.
Hammer, Jeffrey M.; and Olson, Thomas J., 4,345,162, Cl. 307-39.000.
Nelson, Marvin D., 4,345,301, Cl. 361-400.000.
Honeywell Information Systems Inc.: *See*—
Jacobsthal, Herbert K., 4,345,250, Cl. 340-825.500.
Hong, Sung H.: *See*—
Nuttall, David A.; and Hong, Sung H., 4,344,818, Cl. 162-111.000.
Honjyo, Yutaka: *See*—
Morita, Riyozo; and Honjyo, Yutaka, 4,344,579, Cl. 241-34.000.
Hooper, Homer; and Holland, R. B., to Continental Conveyor & Equipment Company, Inc. Conveyor idler roll assembly and method of producing same. 4,344,2[illegible], Cl. 29-516.000.
Hooper, Ira: *See*—
Berman, Herbert M.; and Hooper, Ira, 4,344,262, Cl. 52-227.000.
Hoover, D. Robert, to Identronix, Inc. Passive sensing and encoding transponder. 4,345,253, Cl. 343-6.8LC.
Hopper, James F.: *See*—
Blagaila, John H.; and Hopper, James F., 4,345,280, Cl. 360-49.000.
Horikoshi, Hiroshi: *See*—
Takase, Akio; Horikoshi, Hiroshi; and Kasada, Toshio, 4,345,132, Cl. 219-10.55B.
Horiuchi, Michimasa; Ibamoto, Masahiko; and Rokutan, Hideaki, to Hitachi, Ltd. Chopper control system. 4,345,190, Cl. 318-338.000.
Horne, C. James; and Duffy, Edward A. Hydraulic heating system. 4,344,567, Cl. 237-1.00R.
Horner, Michael; and Nissen, Axel, to BASF Aktiengesellschaft. Preparation of 2-hydroxyalkylchromans. 4,344,886, Cl. 549-408.000.
Hoshall, Thomas C.; Hicks, LaVern L.; and Renth, Larry. Fibrous material apparatus. 4,344,580, Cl. 241-60.000.
Hostetler, Eldon. Pressure responsive liquid flow regulator. 4,344,456, Cl. 137-403.000.
Houston Systems Manufacturing Co., Inc.: *See*—
Chan, John C. H., 4,344,454, Cl. 137-315.000.
Howard, Benedick J.; and Lill, Emil, to Kennametal Inc. Otterboard. 4,344,247, Cl. 43-9.000.
Howard, Kenneth J.; and Sidwell, Albert E., to Vertac Chemical Corporation. Chlorination of phenols and phenoxyacetic acids with sulfuryl chloride. 4,345,097, Cl. 562-472.000.
Howard, Richard E.: *See*—
Craighead, Harold G.; Howard, Richard E.; and Tennant, Donald M., 4,344,816, Cl. 156-643.000.
Howell, Edward K., to General Electric Company. Ground fault circuit interrupting device with improved thyristor triggering. 4,345,289, Cl. 361-45.000.
Howie, James B.; and McLeod, John, to Ferranti Limited. Laser energy control circuit. 4,345,330, Cl. 372-29.000.
Howze, Bruce, to Community Light & Sound, Inc. Directional loudspeaker. 4,344,504, Cl. 181-187.000.
Hozumi, Kazuhiro; and Tamaki, Shigeo, to Kuroda Precision Industries Ltd. Electromagnetic valve apparatus with a hand-operated transfer device. 4,344,603, Cl. 251-130.000.
Hsieh, Harry W. S.: *See*—
Rizk, Sidky D.; Hsieh, Harry W. S.; and Prendergast, John J., 4,345,053, Cl. 525-440.000.
Hubbard, Seth A.: *See*—
Sloyan, Jerome J., 4,344,598, Cl. 248-651.000.
Hufnagel, Theobald; and Hetschko, Manfred, to Cassella Aktiengesellschaft. Process for the manufacture of a violet organic pigment, C.I. Pigment Violet 23. 4,345,074, Cl. 544-99.000.
Hughes Aircraft Company: *See*—
Gunther, John E.; Lichty, William R.; and Hoffman, William C., 4,344,668, Cl. 350-96.270.
Jarreti, Harold M., Jr.; and Cotter, Thomas P., 4,344,302, Cl. 62-514.00R.
Pines, Michael Y.; Whitney, Colin G.; and Duncan, James S., 4,345,148, Cl. 250-214.00C.
Hughes Tool Company: *See*—
Ledgerwood, Leroy W., III, 4,344,658, Cl. 308-8.200.
Huttemann, Robert D.: *See*—
Bulger, Gary A.; Heck, Lyle D.; Huttemann, Robert D.; Morabito, Joseph M.; Pitetti, Raymond C.; Unger, Burton A.; and Vallere, Donald J., 4,344,223, Cl. 29-577.00C.
Huve, Pierre M., to Societe d'Etudes de Produits Chimiques. Use of isopropylaminopyrimidine in the chemotherapy of muscular dystrophy, myopathy and mytonia. 4,344,947, Cl. 424-251.000.
Huyck Corporation: *See*—
Thompson, Charles E.; and Herring, Samuel H., 4,344,464, Cl. 139-383.00A.
Hydrocarbon Research, Inc.: *See*—
Kunesh, John G., 4,344,840, Cl. 208-59.000.
Hyman, Floyd L.; and Ziv, Martin H., to Air Products and Chemicals, Inc. Scoopable triethylene diamine. 4,345,079, Cl. 544-351.000.
Ibamoto, Masahiko: *See*—
Horiuchi, Michimasa; Ibamoto, Masahiko; and Rokutan, Hideaki, 4,345,190, Cl. 318-338.000.
Ibarzabal, Joe A. Combined soap holder and press. 4,344,529, Cl. 206-77.100.
Ibuki, Yasuhiro, to Meinan Machinery Works, Inc. Reinforced veneer sheet and the method of manufacturing the reinforced veneer sheet. 4,344,471, Cl. 144-345.000.
Identronix, Inc.: *See*—
Hoover, D. Robert, 4,345,253, Cl. 343-6.8LC.
Idogaki, Takaharu; Kawai, Hisasi; Matsui, Takeshi; Hattori, Kyo; and Sakurai, Kazuhiro, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Rotary actuator. 4,345,228, Cl. 335-222.000.
Ienna-Balistreri, Angelo. Gas detector. 4,345,242, Cl. 340-634.000.
Igawa, Tatsuo: *See*—
Sawada, Hiroji; Igawa, Tatsuo; and Nagae, Hiromitsu, 4,345,120, Cl. 200-19.00R.
IHC Holland N.V.: *See*—
Verboom, Pieter, 4,344,239, Cl. 37-66.000.
Iida, Masachika: *See*—
Okutomi, Tsutomu; Iida, Masachika; Kuwabara, Kazuyoshi; Yoshino, Hisashi; and Takayanagi, Eiichi, 4,345,130, Cl. 200-268.000.
Iijima, Kazunori: *See*—
Miyakawa, Seii; Kawauchi, Akira; Iijima, Kazunori; Terayama, Takao; Yoshida, Masashi; and Kawase, Hideyuki, 4,345,282, Cl. 360-85.000.
Iijima, Tamotsu; and Takagi, Yasuo, to Nissan Motor Company, Limited. Spark-ignition internal combustion engine. 4,344,392, Cl. 123-179.00G.
Iizuka, Haruhiko: *See*—
Etoh, Yukihiro; Tanaka, Toshiaki; Sugasawa, Fukashi; and Iizuka, Haruhiko, 4,344,393, Cl. 123-198.00F.
Iizuka, Yoshitoku; and Ohkubo, Kiyokazu, to Honda Giken Kogyo Kabushiki Kaisha. Centrifugal type oil filter for an engine. 4,344,561, Cl. 233-24.000.
Ikarus Karosszeria es Jarmugyar: *See*—
Ratsko, Istvan; Ivony, Jozsef; Madi, Jeno; and Karasz, Gyorgy, 4,344,640, Cl. 280-432.000.
Ikenoue, Yutaka: *See*—
Endo, Hiroyuki; and Ikenoue, Yutaka, 4,344,795, Cl. 75-230.000.
Ikeura, Kenji, to Nissan Motor Company, Limited. Idle speed control method and system for an internal combustion engine of an automotive vehicle. 4,344,398, Cl. 123-339.000.
Ikuta, Hironori: *See*—
Machida, Yoshimasa; Saito, Isao; Nomoto, Seiichiro; Negi, Shigeto; Ikuta, Hironori; and Kitoh, Kyosuke, 4,344,944, Cl. 424-246.000.

Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, to Shin-Etsu Chemical Co., Ltd. Method for modifying surface properties of a shaped article of a silicone. 4,344,981, Cl. 427-40.000.

Imbert, Jean C. Full dual element prosthesis designed for the femoro-patellar joint. 4,344,192, Cl. 3-1.910.

Immel, Joseph D. Orthopedic bed. 4,344,422, Cl. 128-33.000.

Imperial Chemical Industries Limited: *See—*
Laidler, Dale A.; and Milner, David J., 4,344,894, Cl. 260-465.00D.

Inaga, Hisashi: *See—*
Kondo, Tadashige; Ohno, Susumu; Takata, Kenichi; and Inaga, Hisashi, 4,344,395, Cl. 123-335.000.

Inchauspe, Nicolas, to Dumas et Inchauspe. Process for the continuous preparation of sulfonates derived from molecules having long alkyl chains and, more particularly, sulfonates derived from fatty esters. 4,344,889, Cl. 260-400.000.

Inco Ltd.: *See—*
O'Neill, Charles E., 4,344,792, Cl. 75-9.000.

Industrial Air, Inc.: *See—*
Smith, W. Christen; McGill, Terry J.; and Spangler, Herbert L., 4,344,370, Cl. 110-162.000.

Inoue, Shigeki: *See—*
Amada, Nobutaka; and Inoue, Shigeki, 4,345,215, Cl. 330-268.000.

Inoue, Tadashi, to Lobster Tool Co., Ltd. Riveter. 4,344,311, Cl. 72-391.000.

Inoue, Tetsuzo: *See—*
Hasegawa, Junzo; Kawabata, Susumu; Kono, Kiichi; and Inoue, Tetsuzo, 4,344,466, Cl. 139-449.000.

Inoue, Tokuta; Nakanishi, Kiyoshi; Kanda, Mutsumi; Nakada, Masahiko; and Matsuura, Toshiharu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Cylinder head, spark plug, and piston configuration. 4,344,408, Cl. 123-661.000.

Institut Francais du Petrole: *See—*
Rojey, Alexandre, 4,344,292, Cl. 62-114.000.

Instranetics, Inc.: *See—*
Eldridge, John D., Jr.; and Cohen, Milton W., 4,344,532, Cl. 206-370.000.

International Business Machines Corporation: *See—*
Bergeron, David L.; and Smith, Paul H., 4,344,222, Cl. 29-571.000.
Cazarra, Victor; Schwab, Andre; and Zunino, Patrick, 4,344,815, Cl. 156-601.000.
Double, Glen P., 4,345,278, Cl. 360-2.000.
Elliott, Brian J., 4,345,239, Cl. 340-146.3SY.
Grant, Duane E.; and Walker, James R., 4,344,691, Cl. 355-1.000.
Melamud, Robert C.; Nihart, James D.; and White, James M., 4,345,314, Cl. 364-515.000.

International Container Systems, Inc.: *See—*
deLarosiere, Pierre J., 4,344,530, Cl. 206-203.000.

International Harvester Co.: *See—*
Pollard, Lorne R., 4,344,639, Cl. 280-411.00C.
Schmittbetz, Klaus; and Struchtrup, Karl D. S., 4,344,334, Cl. 74-473.00R.

International Playtex, Inc.: *See—*
Sterling, Larry D.; and Melvin, Wilbert, Jr., 4,344,197, Cl. 8-150.000.

International Standard Electric Corporation: *See—*
Bolssens, Frans P. J.; Franck, Guy C. J. L. G. G. M.; and Dehertefelt, Henri, 4,344,212, Cl. 29-33.00F.
Stoka, Roberto; and Lotzsch, Ulrich, 4,344,511, Cl. 188-73.450.

International Telephone and Telegraph Corporation: *See—*
Aaron, Robert L.; and Murphy, Eugene F., 4,345,147, Cl. 235-385.000.

Interox Chemicals Limited: *See—*
Martin, Brian, 4,344,923, Cl. 423-20.000.

Interox (Societe Anonyme): *See—*
Gago, Ignace; and Coppens, Guillaume, 4,344,979, Cl. 427-4.000.

Iriguchi, Norio; Unno, Hiroshi; and Tsuda, Nobuaki, to Asahi Kasei Kogyo Kabushiki Kaisha. Container, apparatus and method for separating platelets. 4,344,560, Cl. 233-19.00A.

Isaka, Haruki: *See—*
Yusa, Haruhiko; Oota, Masanori; and Isaka, Haruki, 4,345,043, Cl. 523-209.000.

Isambert, Gilles: *See—*
Frechou, Jerome; and Isambert, Gilles, 4,344,359, Cl. 99-580.000.

Isbell, Tim D.: *See—*
Congdon, James S.; and Isbell, Tim D., 4,345,218, Cl. 330-298.000.

Ishibashi, Yoji: *See—*
Minakawa, Yoshimitsu; Ishibashi, Yoji; Sato, Isao; Uchiyama, Yoshihiro; and Takahashi, Kazuyoshi, 4,344,280, Cl. 60-39009.00F.

Ishida, Osami: *See—*
Komuro, Keigo; Yamada, Matsuichi; Aoki, Katsuhiko; Yoshikawa, Yoshihiko; Itoh, Fumio; Takeda, Fumio; and Ishida, Osami, 4,345,255, Cl. 343-100.0PE.

Ishida, Tokuji; Taniguchi, Nobuyuki; Itoh, Masatoshi; Matsumoto, Toshiaki; Izumi, Tatsuro; and Niwa, Masatake, to Minolta Camera Kabushiki Kaisha. Photographic devices for controlling flash photography. 4,344,680, Cl. 354-33.000.

Ishihara Sangyo Kaisha Ltd.: *See—*
Nishiyama, Ryuzo; Haga, Takahiro; Toki, Tadaaki; Koyanagi, Tohru; and Murai, Shigeo, 4,344,951, Cl. 424-263.000.

Ishii, Koji, to Ryobi Ltd. Impression cylinder cleaning device for printing machine. 4,344,362, Cl. 101-425.000.

Ishii, Yoshiaki; Kume, Tsutomu; Ando, Naoyoshi; and Fujinami, Shosaku, to Agency of Industrial Science and Technology. Method for pyrolyzing. 4,344,373, Cl. 110-347.000.

Ishikawa, Hirotoshi: *See—*
Tamura, Hisashi; Taniguchi, Naozo; and Ishikawa, Hirotoshi, 4,345,150, Cl. 250-339.000.

Ishikawa, Isao; Kanda, Hiroshi; and Yamamoto, Shinji, to Hitachi Medical Corporation. Ionization chamber type X-ray detector. 4,345,156, Cl. 250-385.000.

Ishikawa, Masaaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Linear light source fixing device used in a facsimile transmission apparatus. 4,345,277, Cl. 358-293.000.

Ishikawa, Norikatsu: *See—*
Konishi, Masami; Kuramoto, Akio; Maeda, Yorishige; Ishikawa, Norikatsu; and Suzuki, Makoto, 4,344,407, Cl. 123-661.000.

Isikawa, Kingo. Device for successively stripping sheet from a stack of sheets. 4,344,613, Cl. 271-165.000.

Isobe, Toshiyuki, to Daiwa Corporation. Three-dimensional combination toy. 4,344,623, Cl. 273-153.00S.

Isserlis, Morris D. Air pollution control system. 4,344,779, Cl. 55-233.000.

Isserlis, Morris D. Air pollution control system. 4,344,920, Cl. 422-169.000.

Itoh, Fumio: *See—*
Komuro, Keigo; Yamada, Matsuichi; Aoki, Katsuhiko; Yoshikawa, Yoshihiko; Itoh, Fumio; Takeda, Fumio; and Ishida, Osami, 4,345,255, Cl. 343-100.0PE.

Itoh, Masatoshi: *See—*
Ishida, Tokuji; Taniguchi, Nobuyuki; Itoh, Masatoshi; Matsumoto, Toshiaki; Izumi, Tatsuro; and Niwa, Masatake, 4,344,680, Cl. 354-33.000.

Itoh, Yusuke: *See—*
Hasegawa, Junzo; Kawabata, Susumu; Yoshida, Kazunori; Suzuki, Fuzio; Itoh, Yusuke; Suzuki, Hajime; Arakawa, Hiroshi; and Kobayashi, Akira, 4,344,465, Cl. 139-435.000.

ITT Industries, Inc.: *See—*
Budecker, Ludwig; and Schutt, Bernd, 4,344,451, Cl. 137-101.000.

Ivony, Jozsef: *See—*
Ratsko, Istvan; Ivony, Jozsef; Madi, Jeno; and Karasz, Gyorgy, 4,344,640, Cl. 280-432.000.

Iwama, Atsuaki, to Kobe Steel, Ltd. Mechanism for setting slip and/or camber angles in tire testing machine. 4,344,325, Cl. 73-146.000.

Iwasaki, Shinichiro, to Aisin Seiki Company, Limited. Fluid flow meter. 4,344,331, Cl. 73-861.760.

Iwata, Tadao: *See—*
Takeda, Nobuyuki; and Iwata, Tadao, 4,345,054, Cl. 525-480.000.

IXL Manufacturing Co., Inc.: *See—*
Keathley, Bob N., 4,344,901, Cl. 264-23.000.

Izumi, Tatsuro: *See—*
Ishida, Tokuji; Taniguchi, Nobuyuki; Itoh, Masatoshi; Matsumoto, Toshiaki; Izumi, Tatsuro; and Niwa, Masatake, 4,344,680, Cl. 354-33.000.

J. H. Fenner & Co. Ltd.: *See—*
Bancroft, John; Greenhalgh, John L.; and Smith, Ronald, 4,344,525, Cl. 198-499.000.

J. I. Case Company: *See—*
Hirsch, Arthur E., 4,344,733, Cl. 414-694.000.
Shumaker, John F., 4,344,734, Cl. 414-710.000.

Jackel, Inc.: *See—*
Hoffman, John J., 4,344,543, Cl. 220-1.00B.

Jackson, Charles R., to E-Systems, Inc. Frequency agile hold-sample-hold phase detector. 4,345,219, Cl. 331-1.00A.

Jackson, Liam R., to United States of America, National Aeronautics and Space Administration. Multiwall thermal protection system. 4,344,591, Cl. 244-158.00A.

Jacobellis, Ulrico. Catheter for use in localizing the origin of idiopathic microscopic hematuria. 4,344,439, Cl. 128-636.000.

Jacobsthal, Herbert K., to Honeywell Information Systems Inc. Information communication system with collision avoidance. 4,345,250, Cl. 340-825.500.

Jadlocki, Joseph F., Jr.: *See—*
Thompson, John S.; and Jadlocki, Joseph F., Jr., 4,344,977, Cl. 426-532.000.

Jaeschke, James R.; and Rutchik, Walter L., to Eaton Corporation. Minimum size, integral, A.C. overload current sensing, remote power controller. 4,345,292, Cl. 361-94.000.

Jamison, Warren E.; and McVeigh, James J., to Projected Lubricants, Inc. Lubricated wire rope. 4,344,278, Cl. 57-221.000.

Janniello, Frank, to Clairol Incorporated. Detachable cord. 4,345,122, Cl. 200-50.00B.

Janome Sewing Machine Co., Ltd.: *See—*
Hanyu, Susumu; Tonomura, Yoshinobu; and Watanabe, Kazuo, 4,345,196, Cl. 318-812.000.

Jansen, Johann J.: *See—*
Bijen, Jan M. J. M.; and Jansen, Johann J., 4,344,804, Cl. 156-42.000.

Janssen, Harry R.: *See—*
Graf, Harlan G.; Janssen, Harry R.; and Edwards, Don L., 4,344,754, Cl. 432-233.000.

Jarrett, Harold M., Jr.; and Cotter, Thomas P., to Hughes Aircraft Company. Thermal coupling structure for cryogenic refrigeration. 4,344,302, Cl. 62-514.00R.

Jean-Claude Berney SA: *See—*
Berney, Jean-Claude, 4,345,320, Cl. 368-87.000.

Jennings, Thomas C.; and Fletcher, Charles W., Jr., to Dart Industries, Inc. Resin stabilizer systems of organotin sulfur-containing compounds and organic over-based complexes. 4,345,045, Cl. 524-180.000.

Jensen, Leif, to Rockwool International A/S. Method of producing molten stone material in a cupola furnace. 4,345,035, Cl. 501-29.000.
Jensen, Thomas H., to PPG Industries, Inc. Modular molten glass column. 4,344,785, Cl. 65-1.000.
Jerry, James H.; and Dickie, Ira A., to Gearco Limited. Geared hub. 4,344,501, Cl. 180-253.000.
Jeschke, Willi; and Junghans, Rudi, to Heidelberger Druckmaschinen Aktiengesellschaft. Ink duct for offset or letterpress printing machines. 4,344,360, Cl. 101-363.000.
Jeschke, Willi; and Muller, Hans, to Heidelberger Druckmaschinen Aktiengesellschaft. Folding apparatus for reel or web-fed rotary printing machines. 4,344,610, Cl. 270-6.000.
Jobling, Alan V.; and Crisp, David J., to Black & Decker Inc. Lawn scarifier and rake. 4,344,273, Cl. 56-16.700.
JOBS S.p.A.: *See—*
Pagani, Giacomo, 4,344,221, Cl. 29-568.000.
Johannesen, Donald D.; and Kazmierzak, Andrew F., to Bendix Corporation, The. Disc brake and improved adjuster therefor. 4,344,510, Cl. 188-71.900.
Johnson, D. Emil; Krutchen, Charles M.; and Sharps, G. Vincent, Jr., to Mobil Oil Corporation. Polymer foam extrusion system. 4,344,710, Cl. 366-76.000.
Johnson, John G.: *See—*
Masterson, Robert C., Jr.; Thomas, R. Gordon; and Johnson, John G., 4,344,656, Cl. 303-2.000.
Johnson & Johnson: *See—*
Evans, Anthony; Lesniak, John M.; and Boardman, Franklin, 4,344,423, Cl. 128-90.000.
Johnson, Keith, Jr.; and Long, Robert A., to AMP Incorporated. Pre-assembly and terminating apparatus. 4,344,225, Cl. 29-857.000.
Johnson, Marvin M.; and Nowack, Gerhard P., to Phillips Petroleum Company. Method of removing contaminant from feedstock streams. 4,344,841, Cl. 208-211.000.
Johnson, Richard H. Electrical transient suppressor. 4,345,290, Cl. 361-56.000.
Johnson, Robert M. Flexible tree saw. 4,344,229, Cl. 30-166.00R.
Jones, Donald W., to General Electric Company. Means for reducing shear stresses on winding conductor insulation for air-gap dynamoelectric machines. 4,345,175, Cl. 310-45.000.
Jones, Jessie L.; and Spector, George. Alphabet game. 4,344,627, Cl. 273-273.000.
Jost, Max: *See—*
Umsonst, Gerhard; Kolliker, Hans P.; and Jost, Max, 4,344,767, Cl. 524-159.000.
Jovcic, Dorde: *See—*
Lahrs, Jurgen; Schubert, Klaus; Gosling, Claus; Jovcic, Dorde; Gleinig, Harald; and Skerhut, Reiner, 4,344,766, Cl. 8-524.000.
Joy Manufacturing Company: *See—*
Duff, John; and McFarlane, Peter, 4,344,353, Cl. 91-165.000.
Juenemann, Werner: *See—*
Dehnert, Johannes; and Juenemann, Werner, 4,344,880, Cl. 260-152.000.
Junghans, Rudi: *See—*
Jeschke, Willi; and Junghans, Rudi, 4,344,360, Cl. 101-363.000.
Kabushiki Kaisha Kobe Seiko Sho: *See—*
Fujisawa, Tetsuo; and Tanioka, Takashi, 4,344,538, Cl. 209-144.000.
Kabushiki Kaisha Meiki Seisakusho: *See—*
Morita, Riyozo; and Honjyo, Yutaka, 4,344,579, Cl. 241-34.000.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
Fujihara, Youji; Shiba, Masami; Hazama, Toshio; and Kito, Shozo, 4,344,514, Cl. 192-3.580.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Hasegawa, Junzo; Kawabata, Susumu; Kono, Kiichi; and Inoue, Tetsuzo, 4,344,466, Cl. 139-449.000.
K.K. Toyoda Jidoshokki Seisakusho: *See—*
Hasegawa, Junzo; Kawabata, Susumu; Yoshida, Kazunori; Suzuki, Fuzio; Itoh, Yusuke; Suzuki, Hajime; Arakawa, Hiroshi; and Kobayashi, Akira, 4,344,465, Cl. 139-435.000.
K.K. Toyota Chuo Kenkyusho: *See—*
Hasegawa, Junzo; Kawabata, Susumu; Yoshida, Kazunori; Suzuki, Fuzio; Itoh, Yusuke; Suzuki, Hajime; Arakawa, Hiroshi; and Kobayashi, Akira, 4,344,465, Cl. 139-435.000.
Kaffee-Veredelungs-Werk Koffeinfrei Kaffee GmbH & Co.: *See—*
Sirtl, Wolfgang, 4,344,974, Cl. 426-271.000.
Kahn, Sherwin R., to Western Electric Company, Inc. Non-destructive testing of a laminated ceramic capacitor. 4,344,326, Cl. 73-587.000.
Kaiser, Heinz: *See—*
Meddings, Basil; and Kaiser, Heinz, 4,344,574, Cl. 239-338.000.
Kalaus, Gyorgy: *See—*
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Dancsi, Lajos; Keve, Tibor; and Gazdac, Maria, 4,345,082, Cl. 546-51.000.
Kalcor Coatings Company, Inc.: *See—*
Zucker, Newton; and Ellslager, William M., 4,344,858, Cl. 252-358.000.
Kaleskas, Edward W.: *See—*
Paradis, Joseph R.; and Kaleskas, Edward W., 4,344,549, Cl. 222-465.00A.
Kalfoglou, George, to Texaco Inc. Modified lignosulfonates as additives in oil recovery processes involving chemical recovery agents. 4,344,487, Cl. 166-274.000.
Kambara, Yoshihiko: *See—*
Asano, Shiro; Shizuka, Kohei; Kambara, Yoshihiko; Mikami, Junji; Kato, Hiroshi; and Honda, Tadatoshi, 4,345,101, Cl. 564-206.000.
Kampf, Julian C.; Graefe, Richard J.; and Profio, Mark V., to Square D Company. Solid state over-current protective apparatus for a power circuit. 4,345,288, Cl. 361-31.000.
Kanayama, Katsumi; Furuta, Kenzi; and Motoyama, Kazuyasu, to Olympus Optical Co., Ltd. Power supply device for a multifunction apparatus having a plurality of power sources. 4,345,286, Cl. 360-137.000.
Kanda, Hiroshi: *See—*
Ishikawa, Isao; Kanda, Hiroshi; and Yamamoto, Shinji, 4,345,156, Cl. 250-385.000.
Kanda, Mutsumi: *See—*
Inoue, Tokuta; Nakanishi, Kiyoshi; Kanda, Mutsumi; Nakada, Masahiko; and Matsuura, Toshiharu, 4,344,408, Cl. 123-661.000.
Kandybowski, Steven J.: *See—*
Corman, Ned E.; Kandybowski, Steven J.; Scheingold, William S.; and Youngfleish, Frank C., 4,345,267, Cl. 357-81.000.
Kaneko, Tamaki; and Okuzawa, Tugio, to Ricoh Company, Ltd. Collator. 4,344,614, Cl. 271-288.000.
Kanner, Bernard: *See—*
Vick, Steven C.; and Kanner, Bernard, 4,345,088, Cl. 556-410.000.
Kaplan, Daniel; Landouar, Pierre; and Criton, Eric, to Thomson-CSF. Process for producing a layer containing silicon. 4,344,984, Cl. 427-74.000.
Kaplan, Leonard, to Union Carbide Corporation. Hydroxymethylation of the carbon residue of organosilicon compounds. 4,345,103, Cl. 568-840.000.
Karasz, Gyorgy: *See—*
Ratsko, Istvan; Ivony, Jozsef; Madi, Jeno; and Karasz, Gyorgy, 4,344,640, Cl. 280-432.000.
Karl Schmidt GmbH: *See—*
Zammert, Wolf U., 4,345,138, Cl. 219-121.0LF.
Karrer, Friedrich: *See—*
Nikles, Erwin; and Karrer, Friedrich, 4,344,877, Cl. 524-102.000.
Kasada, Toshio: *See—*
Takase, Akio; Horikoshi, Hiroshi; and Kasada, Toshio, 4,345,132, Cl. 219-10.55B.
Kasama, Nobuhiro; and Kitajima, Tadayuki, to Canon Kabushiki Kaisha. Mechanism for mounting and dismounting a screen-like photosensitive medium. 4,344,700, Cl. 355-3.0SC.
Kashioka, Seiji: *See—*
Yasuye, Toshikazu; Kashioka, Seiji; and Shima, Yoshihiro, 4,345,312, Cl. 364-515.000.
Kasper, Erich, to Licentia Patent-Verwaltungs-G.m.b.H. Photo cathode made from composite semiconductor/glass material. 4,344,803, Cl. 148-33.300.
Kast, Jack L.: *See—*
Bauman, Thomas G.; and Kast, Jack L., 4,344,246, Cl. 42-69.00B.
Kasuya, Yutaka: *See—*
Takai, Haruki; Teranishi, Masayuki; Nakamizo, Nobuhiro; Kasuya, Yutaka; and Kubo, Kazuhiro, 4,344,948, Cl. 424-251.000.
Teranishi, Masayuki; Obase, Hiroyuki; Takai, Haruki; Kubo, Kazuhiro; and Kasuya, Yutaka, 4,344,945, Cl. 424-248.520.
Katabami, Takao: *See—*
Yoshikawa, Yoshihiro; Katabami, Takao; Fujinaga, Katsumi; and Kobayashi, Yoshiaki, 4,344,327, Cl. 73-626.000.
Kateman, Wilhelmus G. M. Mushroom harvesting machine. 4,344,275, Cl. 56-327.00R.
Kato, Hiroshi: *See—*
Asano, Shiro; Shizuka, Kohei; Kambara, Yoshihiko; Mikami, Junji; Kato, Hiroshi; and Honda, Tadatoshi, 4,345,101, Cl. 564-206.000.
Katona, Joseph W., to Mills Products, Inc. Automatic stapling and cutting machine. 4,344,217, Cl. 29-417.000.
Kawabata, Susumu: *See—*
Hasegawa, Junzo; Kawabata, Susumu; Yoshida, Kazunori; Suzuki, Fuzio; Itoh, Yusuke; Suzuki, Hajime; Arakawa, Hiroshi; and Kobayashi, Akira, 4,344,465, Cl. 139-435.000.
Hasegawa, Junzo; Kawabata, Susumu; Kono, Kiichi; and Inoue, Tetsuzo, 4,344,466, Cl. 139-449.000.
Kawai, Hisasi: *See—*
Idogaki, Takaharu; Kawai, Hisasi; Matsui, Takeshi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,345,228, Cl. 335-222.000.
Kawai, Shunichi, to Aisin Seiki Kabushiki Kaisha. Power distributing device for vehicles. 4,344,335, Cl. 74-674.000.
Kawai, Toshiyuki: *See—*
Miki, Isao; Kishihara, Takeshi; Kawai, Toshiyuki; and Furumaki, Naoyuki, 4,344,477, Cl. 164-98.000.
Kawasaki Steel Corporation: *See—*
Matsuzaki, Minoru, 4,344,309, Cl. 72-199.000.
Kawase, Hideyuki: *See—*
Miyakawa, Seii; Kawauchi, Akira; Iijima, Kazunori; Terayama, Takao; Yoshida, Masashi; and Kawase, Hideyuki, 4,345,282, Cl. 360-85.000.
Kawauchi, Akira: *See—*
Miyakawa, Seii; Kawauchi, Akira; Iijima, Kazunori; Terayama, Takao; Yoshida, Masashi; and Kawase, Hideyuki, 4,345,282, Cl. 360-85.000.
Kawazoe, Shozo; Matsui, Takao; and Moriuchi, Takahiko, to Nitto Electric Industrial Co., Ltd. Transparent electrically conductive film. 4,345,000, Cl. 428-212.000.
Kaya, Seitoku: *See—*
Yamabe, Masaaki; Kojima, Gen; and Kaya, Seitoku, 4,345,057, Cl. 526-247.000.

Kazmierzak, Andrew F.: *See—*
Johannesen, Donald D.; and Kazmierzak, Andrew F., 4,344,510, Cl. 188-71.900.

Keathley, Bob N., to IXL Manufacturing Co., Inc. Method of making tool handle. 4,344,901, Cl. 264-23.000.

Kelly, C. Brantley, Jr. Beverage container cooler. 4,344,303, Cl. 62-530.000.

Kelly, Michael J.: *See—*
Futere, Albert L.; and Kelly, Michael J., 4,344,189, Cl. 2-16.000.

Kelly, Wallace N.; and Breunig, Roger D., to United Technologies Corporation. Rotor disk structure. 4,344,738, Cl. 416-95.000.

Kelterbaum, Manfred, to Elastogran Maschinenbau GmbH & Co. Process and apparatus for the counter-current injection-mixing of two or more fluid plastic components which react with one another. 4,344,919, Cl. 422-133.000.

Kemper, Charles R. Solar energy collector. 4,344,416, Cl. 126-438.000.

Kendall Company, The: *See—*
Pankau, Edward F., 4,344,432, Cl. 128-275.000.

Kendall, John A.; Marchildon, Ernest K.; and Stephenson, Grant R., to Du Pont Canada Inc. Self-wiping multiple screw element mixer. 4,344,711, Cl. 366-83.000.

Kennametal Inc.: *See—*
Howard, Benedick J.; and Lill, Emil, 4,344,247, Cl. 43-9.000.

Kennedy Sky-Lites, Inc.: *See—*
Weisner, Kent A.; and Walls, Lester L., Jr., 4,344,261, Cl. 52-200.000.

Kenny, Charles H. Meniscus prosthesis. 4,344,193, Cl. 3-1.911.

Kent, Brian E.: *See—*
Schlueter, Francis E.; and Kent, Brian E., 4,344,271, Cl. 56-13.600.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*
Thiele, Dietrich, 4,344,872, Cl. 252-629.000.

Kerr, Edwin R.: *See—*
Reinhard, Russell R.; Dorawala, Tansukhlal G.; and Kerr, Edwin R., 4,344,865, Cl. 252-420.000.

Kerry, John C.: *See—*
Copping, Leonard G.; Kerry, John C.; Watkins, Thomas I.; Willis, Robert J.; and Palmer, Bryan H., 4,344,893, Cl. 260-456.00A.

Keve, Tibor: *See—*
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Dancsi, Lajos; Keve, Tibor; and Gazdac, Maria, 4,345,082, Cl. 546-51.000.

Kidwell, William J.: *See—*
Tsai, Robert C.; and Kidwell, William J., 4,345,258, Cl. 346-17.000.

Kiehs, Karl: *See—*
Schwarz, Gerd-Ulrich; Kiehs, Karl; and Adolphi, Heinrich, 4,344,961, Cl. 424-285.000.

Kienitz, L. Michael: *See—*
Shaffer, Steven D.; Kienitz, L. Michael; Pitts, James N., Jr.; and Bliss, Richard D., 4,344,712, Cl. 366-108.000.

Kieran, Ann G.: *See—*
Easton, Ian A.; Glen, James M.; and Kieran, Ann G., 4,344,967, Cl. 424-359.000.

Kihlstrom, Ernest H., to Bethlehem Steel Corporation. Method and apparatus for measuring roll gap and alignment for continuous casters. 4,344,232, Cl. 33-143.00L.

Kikkawa, Satoru: *See—*
Sugata, Shigeo; Tachigami, Shigeru; Kikkawa, Satoru; Umezu, Haruo; and Ohkubo, Masanori, 4,345,112, Cl. 174-107.000.

Kim, Chang Kyu; Maggiulli, Cataldo A.; and Zielinski, Paul A., to Eastman Kodak Company. Method for preparing 2-pyrazolin-5-ones from 1,2,4-oxadiazoles. 4,345,085, Cl. 548-360.000.

Kimberly-Clark Corporation: *See—*
Nuttall, David A.; and Hong, Sung H., 4,344,818, Cl. 162-111.000.

Kimura, Kenji, to Olympus Optical Co., Ltd. Time base correction apparatus. 4,345,279, Cl. 360-36.000.

Kinbara, Hiroji: *See—*
Hattori, Yoshiyuki; Matsui, Kazuma; and Kinbara, Hiroji, 4,344,338, Cl. 74-752.00C.

King, Clarence H., to Copco Door Company. Door with variable hinge locations. 4,344,256, Cl. 49-501.000.

Kioritz Corporation: *See—*
Kondo, Tadashige; Ohno, Susumu; Takata, Kenichi; and Inaga, Hisashi, 4,344,395, Cl. 123-335.000.

Kircher, Morton S.: *See—*
Wright, David B.; Moore, Sanders H.; and Kircher, Morton S., 4,344,833, Cl. 204-258.000.

Kirk, Kenneth L., to Amtrol Inc. Tee-type leg bracket. 4,344,645, Cl. 285-61.000.

Kis-Tamas, Attila: *See—*
Novak, Lajos; Szantay, Csaba; Rohaly, Janos; Kis-Tamas, Attila; Varjas, Laszlo; and Csutak, Janos, 4,344,959, Cl. 424-279.000.

Kishi, Jun: *See—*
Kukaya, Hirokazu; and Kishi, Jun, 4,345,189, Cl. 318-317.000.

Kishihara, Takeshi: *See—*
Miki, Isao; Kishihara, Takeshi; Kawai, Toshiyuki; and Furumaki, Naoyuki, 4,344,477, Cl. 164-98.000.

Kita, Jean-Claude: *See—*
Puff, Roger M.; and Kita, Jean-Claude, 4,344,769, Cl. 44-23.000.

Kitagawa, Junji: *See—*
Fujiwara, Toshitaka; Nabeta, Teiichi; Akita, Sigeyuki; and Kitagawa, Junji, 4,344,293, Cl. 62-126.000.

Kitagawa, Yoshihiko; Yuyama, Masahiro; Moritani, Masahiko; and Suzuki, Mikio, to Sumitomo Chemical Company, Limited. Process for producing glass fiber-reinforced transparent cast sheet. 4,344,906, Cl. 264-128.000.

Kitajima, Tadayuki: *See—*
Kasama, Nobuhiro; and Kitajima, Tadayuki, 4,344,700, Cl. 355-3.0SC.

Kitakohji, Toshisuke: *See—*
Yoneda, Yasuhiro; Kitakohji, Toshisuke; and Kitamura, Kenro, 4,345,020, Cl. 430-270.000.

Kitamura, Kenro: *See—*
Yoneda, Yasuhiro; Kitakohji, Toshisuke; and Kitamura, Kenro, 4,345,020, Cl. 430-270.000.

Kito, Shozo: *See—*
Fujihara, Youji; Shiba, Masami; Hazama, Toshio; and Kito, Shozo, 4,344,514, Cl. 192-3.580.

Kitoh, Kyosuke: *See—*
Machida, Yoshimasa; Saito, Isao; Nomoto, Seiichiro; Negi, Shigeto; Ikuta, Hironori; and Kitoh, Kyosuke, 4,344,944, Cl. 424-246.000.

Klausz, Remy, to Thomson-CSF. Process for use of an X-ray tomoscanner making it possible to perform cinedensigraphy and corresponding adaptation of tomo-scanner. 4,345,157, Cl. 378-19.000.

Kleemann, Axel; Lussling, Theodor; Pfeifer, Wolf; and Scherberich, Paul, to Degussa AG. Process for the production of 5-arylidene hydantoins (B). 4,345,072, Cl. 542-442.000.

Klein, Max, to Klein, Max. Method for separating gases liquid droplets and/or solid particles from gases or vapors. 4,344,775, Cl. 55-75.000.

Klein, Max, to Klein, Max. Filtration using expanded styrene-polymer and polyolefin micro-bits. 4,344,846, Cl. 210-503.000.

Klockner-Humboldt-Deutz AG: *See—*
Paschen, Peter; Pfeiffer, Roland; Waldhecker, Heinz-Dieter; Kryczun, Alfred; and Pufal, Rolf, 4,344,773, Cl. 48-92.000.

Klockner-Werke AG: *See—*
Fink, Lothar; and Wojcichowski, Lothar, 4,344,601, Cl. 249-167.000.

Klose, Peter H.; and Ovshinsky, Herbert C., to Energy Conversion Devices, Inc. Microfiche recording system with traveling film head. 4,344,701, Cl. 355-51.000.

Klutchko, Sylvester: *See—*
Hoefle, Milton L.; and Klutchko, Sylvester, 4,344,949, Cl. 424-258.000.

Knapp, Donald K. Welding backup tape and its method of manufacture. 4,344,556, Cl. 228-50.000.

Knight, Pete L. Railway gang car coupler. 4,344,542, Cl. 213-188.000.

Knoll, Harold H., to Quaker Window Products Co. Window sash. 4,344,255, Cl. 49-501.000.

Knopp, Christian: *See—*
Siegl, Annemarie; Knopp, Christian; and Reithmayr, Karl, 4,344,933, Cl. 424-79.000.

Knothe, Erich; Berg, Christoph; and Melcher, Franz-Josef, to Sartorius GmbH. Measuring system having a balance with digital display having digit appearance modifying circuit. 4,344,494, Cl. 177-210.00R.

Knox, Keith T., to Xerox Corporation. Image processing method and apparatus having a digital airbrush for touch up. 4,345,313, Cl. 364-515.000.

Kobayashi, Akira: *See—*
Hasegawa, Junzo; Kawabata, Susumu; Yoshida, Kazunori; Suzuki, Fuzio; Itoh, Yusuke; Suzuki, Hajime; Arakawa, Hiroshi; and Kobayashi, Akira, 4,344,465, Cl. 139-435.000.

Kobayashi, Minoru, to Olympus Optical Co., Ltd. Word line number count/display device for tape recorder. 4,345,287, Cl. 360-137.000.

Kobayashi, Satoru; and Watanabe, Hiroshi, to Nippon Electric Co., Ltd. Output circuit. 4,345,172, Cl. 307-562.000.

Kobayashi, Yoshiaki: *See—*
Yoshikawa, Yoshihiro; Katabami, Takao; Fujinaga, Katsumi; and Kobayashi, Yoshiaki, 4,344,327, Cl. 73-626.000.

Kobe Steel, Ltd.: *See—*
Godai, Tomokazu; Minato, Shoji; Nishimura, Katushi; and Ogawa, Tsuneshi, 4,345,140, Cl. 219-146.230.
Iwama, Atsuaki, 4,344,325, Cl. 73-146.000.

Kobori, Yuzuru, to Sony Corporation. Cathode ray tube apparatus. 4,345,185, Cl. 315-3.000.

Koch, Klaus, to Hermann Berstorff Maschinenbau GmbH. Method for monitoring and controlling hydrogenation pressure in plant for the hydrogenation of coal with hydrogen to form hydrocarbons. 4,344,835, Cl. 208-8.00R.

Koch, Klaus, to Hermann Berstorff Maschinenbau GmbH. Method for converting coal to hydrocarbons by hydrogenation. 4,344,836, Cl. 208-8.00R.

Kockums Industries Limited: *See—*
Bond, Harold U., 4,344,609, Cl. 269-27.000.

Koehler, Mark E.: *See—*
Provder, Theodore; Holsworth, Richard M.; and Koehler, Mark E., 4,344,709, Cl. 356-445.000.

Koenig, Karl-Heinz; Schwendemann, Volker; and Feuerherd, Karl-Heinz, to BASF Aktiengesellschaft. Halogenated tertiary alkyl isocyanates and their preparation. 4,344,891, Cl. 260-453.00A.

Kohler, Klaus; Woditsch, Peter; Rieck, Hilmar; and Rodi, Fritz, to Bayer Aktiengesellschaft. Readily dispersible TiO_2 pigment. 4,344,799, Cl. 106-300.000.

Kohmoto, Shinsuke; and Haneishi, Yasuyuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Locking mechanism in diaphragm setting ring of SLR camera. 4,344,689, Cl. 354-286.000.

Kohmura, Isao, to Mitsubishi Paper Mills, Ltd. Diffusion transfer process. 4,345,019, Cl. 430-234.000.

Kohzai, Yoshinori; Fujioka, Yoshiki; and Ota, Naoto, to Fujitsu Fanuc Limited. Control system for stopping spindle at predetermined rotational position. 4,345,192, Cl. 318-592.000.

Kojima, Gen: *See—*
Yamabe, Masaaki; Kojima, Gen; and Kaya, Seitoku, 4,345,057, Cl. 526-247.000.
Kojima, Yasuhumi; Saito, Atsunori; and Yoshimi, Akiro, to Nippondenso Co., Ltd. Control method and apparatus for air conditioners. 4,344,565, Cl. 236-46.00R.
Kokusai Denshin Denwa Co., Ltd.: *See—*
Komuro, Keigo; Yamada, Matsuichi; Aoki, Katsuhiko; Yoshikawa, Yoshihiko; Itoh, Fumio; Takeda, Fumio; and Ishida, Osami, 4,345,255, Cl. 343-100.0PE.
Kolb, Dieter, to Fichtel & Sachs AG. Disengaging device. 4,344,516, Cl. 192-114.00R.
Kolliker, Hans P.: *See—*
Umsonst, Gerhard; Kolliker, Hans P.; and Jost, Max, 4,344,767, Cl. 524-159.000.
Kolm, Eric A.: *See—*
Kolm, Henry H.; and Kolm, Eric A., 4,345,305, Cl. 362-186.000.
Kolm, Henry H.; and Kolm, Eric A., to Flik, Inc. Portable electronic safety flare system. 4,345,305, Cl. 362-186.000.
Kolos, Vladimir K.: *See—*
Chachin, Viktor N.; Kolos, Vladimir K.; Botyan, Viktor V.; Luzgin, Vladimir I.; and Antonenkov, Igor K., 4,344,313, Cl. 72-453.100.
Komiyama, Tadashi; Oi, Shoichi; Ohnishi, Noriaki; Mori, Shinya; Takata, Tadanobu; and Kubo, Isao, to Mitsui Coke Co., Ltd. Process for the dehydration and liquefaction of water-containing coal. 4,344,837, Cl. 208-8.0LE.
Kompa, Gunter; and Stock, Don J. R., to Endress u. Hauser GmbH u. Co. Distance measuring apparatus based on the pulse travel time method. 4,344,705, Cl. 356-5.000.
Komuro, Keigo; Yamada, Matsuichi; Aoki, Katsuhiko; Yoshikawa, Yoshihiko; Itoh, Fumio; Takeda, Fumio; and Ishida, Osami, to Kokusai Denshin Denwa Co., Ltd.; and Mitsubishi Denki Kabushiki Kaisha. Antenna feed system. 4,345,255, Cl. 343-100.0PE.
Kondo, Kiyoshi; Takashima, Toshiyuki; and Suda, Minoru, to FMC Corporation. Process for producing cis-3-(2,2-disubstituted-ethenyl)-2,2-dimethylcyclopropanecarboxylic acid and intermediates. 4,344,884, Cl. 549-273.000.
Kondo, Tadashige; Ohno, Susumu; Takata, Kenichi; and Inaga, Hisashi, to Kioritz Corporation. Ignition system with ignition timing retarding circuit for internal combustion engine. 4,344,395, Cl. 123-335.000.
Konig, Hans-Bodo: *See—*
Niemers, Ekkehard; Konig, Hans-Bodo; Schrock, Wilfried; and Metzger, Karl G., 4,344,939, Cl. 424-226.000.
Niemers, Ekkehard; Konig, Hans-Bodo; Schrock, Wilfried; and Metzger, Karl G., 4,344,955, Cl. 424-271.000.
Koninklijke Emballage Industrie Van Leer: *See—*
de Leeuw, Johannes A. N.; and Brugmans, Johannes T., 4,344,998, Cl. 428-212.000.
Konishi, Masami; Kuramoto, Akio; Maeda, Yorishige; Ishikawa, Norikatsu; and Suzuki, Makoto, to Toyota Jidosha Kogyo Kabushiki Kaisha. Cylinder head, ports, and piston configuration. 4,344,407, Cl. 123-661.000.
Konishiroku Photo Industry Co., Ltd.: *See—*
Nezu, Takao; and Turubuchi, Yasuo, 4,344,703, Cl. 355-76.000.
Yagi, Michio; and Sawano, Hiroshi, 4,344,679, Cl. 354-25.000.
Kono, Kiichi: *See—*
Hasegawa, Junzo; Kawabata, Susumu; Kono, Kiichi; and Inoue, Tetsuzo, 4,344,466, Cl. 139-449.000.
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Muacevic, Gojko; and Traunecker, Werner, to C. H. Boehringer Sohn. 1-(Alkanoylamino-aryloxy)-2-hydroxy-3-(alkinyl-amino)-propanes and salts thereof. 4,344,964, Cl. 424-304.000.
Koppers Company, Inc.: *See—*
Falck, Glenn H.; and Boose, James R., 4,344,524, Cl. 198-494.000.
Korehisa, Kazuo: *See—*
Fujita, Kenji; Korehisa, Kazuo; Asaba, Hirosi; Harada, Hideo; and Shibuya, Tsuneo, 4,344,204, Cl. 15-93.00A.
Kothe, Wilfried; and Angstmann, Heinz-Dieter, to BASF Aktiengesellschaft. Desizing of textiles consisting of or containing cellulose. 4,344,764, Cl. 8-138.000.
Kovacs, Sandor, to Vasipari Kutato Intezet. Equipment for the measurement of minute weight forces. 4,344,495, Cl. 177-211.000.
Kowinski, John F.: *See—*
Urie, Robert G.; and Kowinski, John F., 4,344,481, Cl. 165-166.000.
Koyanagi, Osamu: *See—*
Aoda, Yukio; Ninomiya, Hiroshi; Yoshida, Kooichi; and Koyanagi, Osamu, 4,344,968, Cl. 424-365.000.
Koyanagi, Tohru: *See—*
Nishiyama, Ryuzo; Haga, Takahiro; Toki, Tadaaki; Koyanagi, Tohru; and Murai, Shigeo, 4,344,951, Cl. 424-263.000.
Kozono, Haruo; and Higashinaka, Hiroshi, to Nippon Steel Corporation. Method of rolling railroad-rails and steels of similar shape by universal rolling. 4,344,310, Cl. 72-225.000.
Kramer, James H., to B. F. Goodrich Company, The. Method of making a bearing. 4,344,806, Cl. 156-154.000.
Krass, Dennis K., to PPG Industries, Inc. Acids and esters of 5-(2-optionally substituted-4-trifluoromethyl-6-optionally substituted phenoxy)-2-nitro, -halo, or-cyano alpha substituted phenyl carboxy oximes, and method of controlling weeds with them. 4,344,789, Cl. 71-105.000.
Kress, David R., to Matrix Unlimited, Inc. Process of recovering unpolymerized photopolymer from printing plates. 4,345,022, Cl. 430-329.000.
Kress, Dieter; and Haberle, Friedrich, to MAPAL Fabrik fur Prazisionswerkzeuge Dr. Kress KG. Cutting tool assembly. 4,344,724, Cl. 407-36.000.
Kresse, Horst: *See—*
Demus, Dietrich; Zaschke, Horst; Vorbrodt, Hans-Mathias; Kresse, Horst; and Weissflog, Wolfgang, 4,344,856, Cl. 252-299.610.
Krone GmbH: *See—*
Forberg, Horst; and Achtnig, Klaus-Peter, 4,345,294, Cl. 361-119.000.
Krupp Polysius AG: *See—*
Heinemann, Otto; and Schmits, Heinz-Herbert, 4,344,783, Cl. 55-459.00B.
Kruschke, Marvin R., Sr.: *See—*
Longacre, Kenneth E.; and Kruschke, Marvin R., Sr., 4,344,651, Cl. 299-5.000.
Krutchen, Charles M.: *See—*
Johnson, D. Emil; Krutchen, Charles M.; and Sharps, G. Vincent, Jr., 4,344,710, Cl. 366-76.000.
Kryczun, Alfred: *See—*
Paschen, Peter; Pfeiffer, Roland; Waldhecker, Heinz-Dieter; Kryczun, Alfred; and Pufal, Rolf, 4,344,773, Cl. 48-92.000.
Krzywicki, Donald J.: *See—*
Ejk, Adam J.; and Krzywicki, Donald J., 4,345,046, Cl. 524-223.000.
Kubo, Isao: *See—*
Komiyama, Tadashi; Oi, Shoichi; Ohnishi, Noriaki; Mori, Shinya; Takata, Tadanobu; and Kubo, Isao, 4,344,837, Cl. 208-8.0LE.
Kubo, Kazuhiro: *See—*
Takai, Haruki; Teranishi, Masayuki; Nakamizo, Nobuhiro; Kasuya, Yutaka; and Kubo, Kazuhiro, 4,344,948, Cl. 424-251.000.
Teranishi, Masayuki; Obase, Hiroyuki; Takai, Haruki; Kubo, Kazuhiro; and Kasuya, Yutaka, 4,344,945, Cl. 424-248.520.
Kubota, Yukio. Device for determining location of the tip of catheter. 4,344,436, Cl. 128-350.00R.
Kuelpmann, Robert: *See—*
Grote, Hugo; Hasselmann, Heinz; Kunze, Volkmar; Zacharias, Karl; Kuelpmann, Robert; and Mueller, Paul, 4,344,515, Cl. 192-67.00R.
Kugler, Edwin L.: *See—*
McCandlish, Larry E.; Wright, Franklin J.; and Kugler, Edwin L., 4,345,038, Cl. 518-711.000.
Kuhle, Engelbert; Paulus, Wilfried; Genth, Hermann; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Sulphenylated acylurethanes and their use as fungicides. 4,344,962, Cl. 424-300.000.
Kuipers, Arie: *See—*
van der Lely, Ary; Bom, Cornelis J. G.; and Kuipers, Arie, 4,344,499, Cl. 180-197.000.
Kukaya, Hirokazu; and Kishi, Jun, to Nippon Electric Co., Ltd. Motor rotation speed control circuit. 4,345,189, Cl. 318-317.000.
Kulikowski, Andrzej S. Marine propulsion system. 4,344,760, Cl. 440-3.000.
Kume, Tsutomu: *See—*
Ishii, Yoshiaki; Kume, Tsutomu; Ando, Naoyoshi; and Fujinami, Shosaku, 4,344,373, Cl. 110-347.000.
Kummer, Werner: *See—*
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Muacevic, Gojko; and Traunecker, Werner, 4,344,964, Cl. 424-304.000.
Kundig, Armin. Self-contained device for spraying a heated spray material. 4,344,571, Cl. 239-130.000.
Kunesh, John G., to Hydrocarbon Research, Inc. Hydrocracking and hydrotreating shale oil in multiple catalytic reactors. 4,344,840, Cl. 208-59.000.
Kunig, Helmut, to Nordischer Maschinenbau Rud. Baader GmbH & Co. KG. Needle plate for needle bars of needle bar drawing devices. 4,344,208, Cl. 19-129.00R.
Kunitake, Tatsuro; Ohtani, Hiroo; Watanabe, Seiichi; Takigawa, Toshiji; and Matsumoto, Yoshiro, to Sumitomo Metal Industries, Ltd. Heavy thick high-strength casting having improved weldability and impact properties. 4,344,801, Cl. 148-3.000.
Kunz Maschinen- u. Apparatebau GmbH: *See—*
Eiche, Hans, 4,344,304, Cl. 464-85.000.
Kunze, Volkmar: *See—*
Grote, Hugo; Hasselmann, Heinz; Kunze, Volkmar; Zacharias, Karl; Kuelpmann, Robert; and Mueller, Paul, 4,344,515, Cl. 192-67.00R.
Kuramoto, Akio: *See—*
Konishi, Masami; Kuramoto, Akio; Maeda, Yorishige; Ishikawa, Norikatsu; and Suzuki, Makoto, 4,344,407, Cl. 123-661.000.
Kuramoto, Shiyunji: *See—*
Sono, Kenzo; and Kuramoto, Shiyunji, 4,344,988, Cl. 427-255.500.
Kurata, Noboru; Miyazaki, Kunio; and Yamamoto, Kuniyuki, to Honda Giken Kogyo Kabushiki Kaisha. Power transmission casing apparatus in motorized two-wheeled vehicle. 4,344,500, Cl. 180-230.000.
Kuratani, Osamu: *See—*
Matsumoto, Tadashi; Kuratani, Osamu; Hirose, Yasunori; and Toba, Susumu, 4,345,102, Cl. 568-678.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Yusa, Haruhiko; Oota, Masanori; and Isaka, Haruki, 4,345,043, Cl. 523-209.000.
Kurkov, Victor P., to Chevron Research Company. Preparation of 2-cyanoaldehydes by rhodium-catalyzed hydroformylation. 4,344,896, Cl. 260-465.100.
Kuroda, Akira; Nakamura, Tsutomu; and Onishi, Masatoshi, to Hodogaya Chemical Co., Ltd. Polyurethane-modified polyisocyanurate foam and method for producing the same. 4,345,042, Cl. 521-112.000.

Kuroda Precision Industries Ltd.: *See*—
Hozumi, Kazuhiro; and Tamaki, Shigeo, 4,344,603, Cl. 251-130.000.

Kurose, Hideo, to Kuwada, Momoyo. Low noise electrolytic capacitors. 4,345,302, Cl. 361-433.000.

Kuwabara, Kazuyoshi: *See*—
Okutomi, Tsutomu; Iida, Masachika; Kuwabara, Kazuyoshi; Yoshino, Hisashi; and Takayanagi, Eiichi, 4,345,130, Cl. 200-268.000.

Kuwada, Momoyo: *See*—
Kurose, Hideo, 4,345,302, Cl. 361-433.000.

Kyogoku, Hiroshi: *See*—
Tazaki, Shigemitsu; and Kyogoku, Hiroshi, 4,345,263, Cl. 346-140.00R.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Takai, Haruki; Teranishi, Masayuki; Nakamizo, Nobuhiro; Kasuya, Yutaka; and Kubo, Kazuhiro, 4,344,948, Cl. 424-251.000.
Teranishi, Masayuki; Obase, Hiroyuki; Takai, Haruki; Kubo, Kazuhiro; and Kasuya, Yutaka, 4,344,945, Cl. 424-248.520.

L & M Radiator, Inc.: *See*—
Petaja, Glen E.; and Cedar, Charles E., 4,344,478, Cl. 165-69.000.

Lahde, Frank U. Device for charging containers with an inert gas. 4,344,467, Cl. 141-66.000.

Lahrs, Jurgen; Schubert, Klaus; Gosling, Claus; Jovcic, Dorde; Gleinig, Harald; and Skerhut, Reiner, to Bayer Aktiengesellschaft. Process for the manufacture of preparations with a low dust content. 4,344,766, Cl. 8-524.000.

Laidler, Dale A.; and Milner, David J., to Imperial Chemical Industries Limited. Process for the preparation of cyclopropane carboxylic acid esters. 4,344,894, Cl. 260-465.00D.

Laitinen, Heikki: *See*—
Visa, Heikki; and Laitinen, Heikki, 4,344,731, Cl. 414-471.000.

Landouar, Pierre: *See*—
Kaplan, Daniel; Landouar, Pierre; and Criton, Eric, 4,344,984, Cl. 427-74.000.

Lane, John W.: *See*—
Grasso, Albert P.; and Lane, John W., 4,344,849, Cl. 210-662.000.

Lang, Armin, to Zahnradfabrik Friedrichshafen, AG. Hydraulic auxiliary power steering. 4,344,284, Cl. 60-433.000.

Lang, Paul W., to Payton, Raymus K. Multiple pulse laser assemblies. 4,344,671, Cl. 350-174.000.

Lang, Paul W., to Payton, Raymus K. Light fibers having lengths determined by beam scanning time. 4,345,184, Cl. 313-475.000.

Lang, William H.: *See*—
Chang, Clarence D.; and Lang, William H., 4,344,868, Cl. 252-455.00Z.

Langenhorst, Gunter, to Top-Element Bauelemente fur Innenausbau & Raumgestaltung GmbH & Co. KG. Device for mounting a door leaf in a door opening. 4,344,258, Cl. 49-504.000.

Langer, William J., to MTS Systems Corporation. Flat belt tire tester. 4,344,324, Cl. 73-146.000.

Langlais, Jacques F.; and Valadier, Jean-Claude, to Testut-Aequitas. Integral parallelogram load receiver. 4,344,496, Cl. 177-211.000.

Lantzsch, Reinhard: *See*—
Fuchs, Rainer; Naumann, Klaus; Lantzsch, Reinhard; Hagemann, Hermann; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,344,960, Cl. 424-282.000.

Large, Helen F. Fitted top contour sheet. 4,344,196, Cl. 5-496.000.

Larkin, Mark E.; and Balistreri, Thomas W., to Abbott Laboratories. Pull tab tear cap for container port. 4,344,472, Cl. 150-8.000.

Lary, Richard F.: *See*—
Arulpragasam, Jega A.; Giggi, Robert A.; Lary, Richard F.; and Sullivan, Daniel T., 4,345,309, Cl. 364-200.000.

LaSalle Machine Tool, Inc.: *See*—
Osborne, Robert L., 4,344,507, Cl. 184-6.180.

Latasiewicz, Leonard, to Motorola Inc. Membrane switch assembly with improved spacer. 4,345,119, Cl. 200-5.00A.

Latino, Richard M.; and Paquette, Edmund T., to Wright Line Inc. Cable bushing. 4,344,205, Cl. 16-2.000.

Latzer John B. Transportable compartment refrigeration panel system and method of installing. 4,344,299, Cl. 62-448.000.

Laursen, Paul D. Practice putting trainer. 4,344,624, Cl. 273-176.00F.

Lautenshlager, Gilbert G.: *See*—
Higgins, Frank; Lautenshlager, Gilbert G.; and Bunn, Billy A., 4,344,781, Cl. 55-379.000.

Laval, Michel: *See*—
Allemand, Robert; and Laval, Michel, 4,345,155, Cl. 250-385.000.

Laws, Derek R. J.: *See*—
Sharpe, Frederick R.; Grimmett, Christopher M.; and Laws, Derek R. J., 4,344,978, Cl. 426-600.000.

Le Materiel Telephonique Thomson-CSF: *See*—
Dieudonne, Marc P. G.; and Raillard, Yves G., 4,345,326, Cl. 370-60.000.

Leclerc, Jean; and de Rudder, Jean, to Synthelabo. Process for the isolation of viral glycoproteic antigens and its application to the preparation of vaccines. 4,344,935, Cl. 424-89.000.

Ledgerwood, Leroy W., III, to Hughes Tool Company. Earth boring drill bit with snap ring cutter retention. 4,344,658, Cl. 308-8.200.

Lee, Alan J. C.; and Ling, Robin S. M., to University of Exeter. Plugs for the medullary canal of a bone. 4,344,190, Cl. 3-1.900.

Leebens, James V., Jr.: *See*—
Deckas, Peter C.; Cooper, James A.; and Leebens, James V., Jr., 4,344,784, Cl. 55-473.000.

Lehn, Bertold. Snow ski having air cushion forming undersurface. 4,344,641, Cl. 280-601.000.

Leifeld, Ferdinand, to Trutzscher GmbH & Co. KG. Apparatus and method for separating debris from textile fiber tufts. 4,344,843, Cl. 209-143.000.

Leise, Walter F.; and Darcy, John J., to Burroughs Corporation. Sheet feeder support assembly. 4,344,612, Cl. 271-162.000.

Lemmer, Helmut, to Starkstrom Gummersbach GmbH. Switch. 4,345,225, Cl. 335-132.000.

Lemstra, Pieter J.: *See*—
Smith, Paul; and Lemstra, Pieter J., 4,344,908, Cl. 264-203.000.

Lenzing, Richard S., to General Electric Company. Contact spring arrangement. 4,345,224, Cl. 335-132.000.

Leo Pharmaceutical Products, Ltd. A/S: *See*—
Binderup, Ernst T., 4,345,071, Cl. 542-420.000.

Leonard, Henri, to Societe Micro-Mega S.A. Distributor for the progressive and reversible supply of an air motor, in particular for hand-held dental instruments. 4,344,746, Cl. 418-270.000.

Lerche, Ernst; Raschke, Bernward; and Hartwig, Siegfried, to Verenigte Flugtechnische Werke GmbH. Supervisory and monitoring system for helicopter propeller blades. 4,345,237, Cl. 340-27.00R.

Lermann, Peter: *See*—
Stemme, Otto; Lermann, Peter; and Cocron, Istvan, 4,344,686, Cl. 354-198.000.

Lerner, Bernard, to Automated Packaging Systems, Inc. Detachably connected container strips. 4,344,557, Cl. 229-53.000.

Leroy, Claude, to Cosmos Investigations and Research Societe Francaise a Responsabilite Limitee. Solar collector. 4,344,418, Cl. 126-443.000.

Lesher, Howard D.; and Taff, James T., to Dimetrics, Inc. Welding wire feed device. 4,344,553, Cl. 226-168.000.

Lesniak, John M.: *See*—
Evans, Anthony; Lesniak, John M.; and Boardman, Franklin, 4,344,423, Cl. 128-90.000.

Letraset USA, Inc.: *See*—
Batty, Mark J.; and Groth, Thomas, 4,344,994, Cl. 428-41.000.

Levy, Joseph, to UOP Inc. Bis-amides as corrosion inhibitors. 4,344,861, Cl. 252-391.000.

Lew, Kenneth K., to Children's Hospital Medical Center, The. Mutagenicity assay. 4,345,026, Cl. 435-4.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
Dahlberg, Reinhard, 4,344,832, Cl. 204-258.000.
Kasper, Erich, 4,344,803, Cl. 148-33.300.

Lichty, William R.: *See*—
Gunther, John E.; Lichty, William R.; and Hoffman, William C., 4,344,668, Cl. 350-96.270.

Licitis, Gunars, Sr.: *See*—
Erickson, Erick E.; and Licitis, Gunars, Sr., 4,344,346, Cl. 84-1.180.

Liebert, Karl-Heinz; Tischer, Werner; and Deppenbrock, Christoph, to Zahnradfabrik Friedrichshafen, AG. Hydrostatic auxiliary power steering. 4,344,283, Cl. 60-384.000.

Lill, Emil: *See*—
Howard, Benedick J.; and Lill, Emil, 4,344,247, Cl. 43-9.000.

Lill, Melvin H.; and Roberts, Thomas E., Jr., to FMC Corporation. Apparatus and method for measuring rear wheel toe with respect to chassis centerline. 4,344,234, Cl. 33-228.000.

Lindeen, Gale E., to B. F. Goodrich Company, The. Web drying apparatus. 4,344,236, Cl. 34-110.000.

Linden Chemicals & Plastics, Inc.: *See*—
Burkett, Ronald J.; and Dunn, Luther L., 4,344,793, Cl. 75-81.000.

Lindfors, Olof H. Automatic steering means for a driverless carriage. 4,344,498, Cl. 180-168.000.

Ling, Robin S. M.: *See*—
Lee, Alan J. C.; and Ling, Robin S. M., 4,344,190, Cl. 3-1.900.

Link, James C.: *See*—
Boyle, John F.; Halper, Barry J.; Link, James C.; and Mullane, John C., Jr., 4,344,290, Cl. 62-48.000.

Linstromberg, William J., to Whirlpool Corporation. Control for timed operation of ice maker. 4,344,295, Cl. 62-155.000.

Liquid Carbonic Corporation: *See*—
Tyree, Lewis, Jr.; Missig, James R.; and Rhoades, George D. (said James R. Missing and George D. Rhoades assors. to), 4,344,291, Cl. 62-62.000.

Little, William D. Electrical fuel preheater assembly. 4,345,141, Cl. 219-207.000.

Liu, Don K. K.: *See*—
Allaway, Philip N.; Baginski, Richard M.; Liu, Don K. K.; and Teixeira, Theodore M., 4,344,871, Cl. 252-531.000.

Liu, Hsin-Tuan, to Garrett Corporation, The. Crossover duct. 4,344,737, Cl. 415-199.100.

Liu, Thomas M. H.; Melillo, David G.; Ryan, Kenneth M.; Shinkai, Ichiro; and Sletzinger, Meyer, to Merck & Co., Inc. Intermediate for the preparation of thienamycin. 4,344,885, Cl. 549-291.000.

Ljung, Bo H. G.; and Schroeder, George F., to Singer Company, The. Ring laser gyro dither pulse eliminator. 4,344,706, Cl. 356-350.000.

Lloyd, Paul O.: *See*—
Barger, Danny R.; Eggert, Carl A.; and Lloyd, Paul O., 4,345,193, Cl. 318-612.000.

Lobster Tool Co., Ltd.: *See*—
Inoue, Tadashi, 4,344,311, Cl. 72-391.000.

Locke Technology, Inc.: *See*—
Hoag, Ethan D., 4,345,331, Cl. 372-87.000.

Lockett, James F. Universal sorting apparatus. 4,344,539, Cl. 209-564.000.

Loechel, Hans-Peter; and Cooper, Tom, to Rohm GmbH. Method of treating leather. 4,345,006, Cl. 428-473.000.

Loeser, Werner: *See—*
Steck, Werner; Sarnecki, Wilhelm; Marosi, Laszlo; Ohlinger, Manfred; and Loeser, Werner, 4,344,791, Cl. 75-0.5AA.
Log Etronics, Inc.: *See—*
McIntosh, Walter L., 4,344,699, Cl. 355-20.000.
Long, Robert A.: *See—*
Johnson, Keith, Jr.; and Long, Robert A., 4,344,225, Cl. 29-857.000.
Longacre, Kenneth E.; and Kruschke, Marvin R., Sr., to Baker International Corporation. Corrosive environment tension packer. 4,344,651, Cl. 299-5.000.
Longworth, Joe D., to Rockwell International Corporation. Digital phaselock demodulator. 4,345,211, Cl. 329-50.000.
Lorette, Nicholas B.; and Fosnaugh, Jerry L., to Dow Chemical Company, The. Method for shipping and storing ethylene oxide. 4,344,916, Cl. 422-40.000.
Lotz, Walter E. Slicing apparatus. 4,344,341, Cl. 83-29.000.
Lotzsch, Ulrich: *See—*
Stoka, Roberto; and Lotzsch, Ulrich, 4,344,511, Cl. 188-73.450.
Loucks, George R., to General Electric Company. Block copolymers of polyphenylene oxides and polyformals on non-sterically-hindered dihydric phenols. 4,345,050, Cl. 525-390.000.
Loucks, George R., to General Electric Company. Block copolymers of polyphenylene oxides and polyformals of sterically-hindered dihydric phenols. 4,345,051, Cl. 525-390.000.
Louderback, Allan L.; and Foley, Thomas J., to Beckman Instruments, Inc. Method for increasing shelf-life of a serum conjugated bilirubin reference composition and composition produced thereby. 4,344,864, Cl. 252-408.000.
Low, James M.: *See—*
Capener, Erwin L.; and Low, James M., 4,344,770, Cl. 44-50.000.
Luborsky, Fred E.: *See—*
Fahy, William J.; and Luborsky, Fred E., 4,345,007, Cl. 428-679.000.
Lubrizol Corporation, The: *See—*
Davis, Kirk E.; and Holden, Thomas F., 4,344,854, Cl. 252-45.000.
Lucas, Bernard H.; and Ritcey, Gordon M., to Canadian Patents & Development Ltd. Solvent extraction of chromium and vanadium. 4,344,924, Cl. 423-54.000.
Lucas Industries Limited: *See—*
Harmer, George A., 4,344,509, Cl. 188-1.110.
Walker, Michael J., 4,345,209, Cl. 328-120.000.
Lussling, Theodor: *See—*
Kleemann, Axel; Lussling, Theodor; Pfeifer, Wolf; and Scherberich, Paul, 4,345,072, Cl. 542-442.000.
Lutz, Michael A., to Dow Corning Corporation. Method for producing hydrophobic reinforcing silica fillers and fillers obtained thereby. 4,344,800, Cl. 106-308.00Q.
Luzgin, Vladimir I.: *See—*
Chachin, Viktor N.; Kolos, Vladimir K.; Botyan, Viktor V.; Luzgin, Vladimir I.; and Antonenkov, Igor K., 4,344,313, Cl. 72-453.100.
Lytle, John M.: *See—*
Marchant, David D.; and Lytle, John M., 4,345,173, Cl. 310-11.000.
M. Setek Company Limited: *See—*
Matsumiya, Ritsuo; and Osawa, Mitsuaki, 4,344,380, Cl. 118-66.000.
Maass, Manfred: *See—*
Dudeck, Ingo; and Maass, Manfred, 4,344,318, Cl. 73-35.000.
Machida, Haruhiko, to Yamasa Shoyu Kabushiki Kaisha. Antiviral agent comprising 1-β-D-arabinofuranosylthymine. 4,344,937, Cl. 424-180.000.
Machida, Yoshimasa; Saito, Isao; Nomoto, Seiichiro; Negi, Shigeto; Ikuta, Hironori; and Kitoh, Kyosuke, to Eisai Co., Ltd. 7-α-methoxycephalosporin derivatives, and antibacterial drugs onctaining the same. 4,344,944, Cl. 424-246.000.
MacPhee, John; Gasparrini, Charles R.; and Arnolds, Karlheinz E. H., to Baldwin-Gegenheimer Corporation. Automatic blanket cylinder cleaner. 4,344,361, Cl. 101-425.000.
MacPherson, William F.: *See—*
Davis, James A.; MacPherson, William F.; Mussman, Harry E.; and Shackle, Peter W., 4,345,163, Cl. 307-252.00A.
MacRae, David M.; and Roberts, Karl H., to Colgate-Palmolive Company. Skin care sponge. 4,344,930, Cl. 424-28.000.
Madi, Jeno: *See—*
Ratsko, Istvan; Ivony, Jozsef; Madi, Jeno; and Karasz, Gyorgy, 4,344,640, Cl. 280-432.000.
Madland, Thorvald, to Youngstown Steel Door Company, The. Railway car door driver. 4,344,366, Cl. 105-378.000.
Maeda, Yorishige: *See—*
Konishi, Masami; Kuramoto, Akio; Maeda, Yorishige; Ishikawa, Norikatsu; and Suzuki, Makoto, 4,344,407, Cl. 123-661.000.
Maggiulli, Cataldo A.: *See—*
Kim, Chang Kyu; Maggiulli, Cataldo A.; and Zielinski, Paul A., 4,345,085, Cl. 548-360.000.
Magnex Limited: *See—*
Gray, Paul D., 4,344,266, Cl. 52-742.000.
Magnuson, Ruel D., to Gould Inc. Thermal by-pass valve with integral pressure relief. 4,344,564, Cl. 236-34.500.
Malecek, Jan. Solar energy collector. 4,344,417, Cl. 126-439.000.
Manfreddi, Renato: *See—*
Bernardini, Vincenzo; Garetti, Enzo; and Manfreddi, Renato, 4,345,319, Cl. 365-210.000.
Maniscalco, James A.; and Meier, Wayne R., to United States of America, Energy. Fluidized wall for protecting fusion chamber walls. 4,344,911, Cl. 376-102.000.
Mannesmann DeMag AG: *See—*
Grote, Hugo; Hasselmann, Heinz; Kunze, Volkmar; Zacharias, Karl; Kuelpmann, Robert; and Mueller, Paul, 4,344,515, Cl. 192-67.00R.
Wronka, Bodo, 4,345,332, Cl. 373-74.000.
Manning Holoff Co.: *See—*
Holoff, Manning; and Riggins, James D., 4,344,813, Cl. 156-527.000.
MAPAL Fabrik fur Prazisionswerkzeuge Dr. Kress KG: *See—*
Kress, Dieter; and Haberle, Friedrich, 4,344,724, Cl. 407-36.000.
Mapp, Calvin R. Dust pan for sliding glass door. 4,344,648, Cl. 294-55.000.
Marchant, David D.; and Lytle, John M., to United States of America, Energy. Method of generating electricity using an endothermic coal gasifier and MHD generator. 4,345,173, Cl. 310-11.000.
Marchildon, Ernest K.: *See—*
Kendall, John A.; Marchildon, Ernest K.; and Stephenson, Grant R., 4,344,711, Cl. 366-83.000.
Marissen, Roelof H.: *See—*
Beune, Joannes H.; and Marissen, Roelof H., 4,344,461, Cl. 138-109.000.
Markowitz, H. Toby, to Medtronic, Inc. Pacemaker triggering coupling circuit. 4,344,437, Cl. 128-419.0PG.
Marks, Alvin M. Charged aerosol petroleum recovery method and apparatus. 4,344,488, Cl. 166-303.000.
Marosi, Laszlo: *See—*
Steck, Werner; Sarnecki, Wilhelm; Marosi, Laszlo; Ohlinger, Manfred; and Loeser, Werner, 4,344,791, Cl. 75-0.5AA.
Marschak, Howard J. Display device. 4,344,540, Cl. 211-106.000.
Marsico, Joseph W., Jr.: *See—*
Tomcufcik, Andrew S.; Wright, William B., Jr.; and Marsico, Joseph W., Jr., 4,344,954, Cl. 424-270.000.
Martel, Jacques; Tessier, Jean; Teche, Andre; and Demoute, Jean-Pierre, to Roussel Uclaf. Process for the preparation of (S) α-cyano-3-phenoxy-benzyl alcohol. 4,344,895, Cl. 260-465.00F.
Martin, Brian, to Interox Chemicals Limited. In-situ leaching. 4,344,923, Cl. 423-20.000.
Martin, Edson J. Portable cleat for marine use. 4,344,378, Cl. 114-218.000.
Martin, Frederick H.; and Tsuk, Andrew G., to American Home Products Corporation. Therapeutic compositions with enhanced bioavailability. 4,344,934, Cl. 424-80.000.
Martin, Ronald P.: *See—*
Sonnedecker, Ray L.; and Martin, Ronald P., 4,344,900, Cl. 261-114.0VT.
Martinez, Donald G. Area mapping apparatus. 4,344,231, Cl. 33-1.00G.
Martinsson, Kjell B.: *See—*
Hernestam, Sven E. H.; Martinsson, Kjell B.; Christensson, Erik G.; and Olsson, Nils-Goran E., 4,344,952, Cl. 424-267.000.
Maruzen Oil Co., Ltd.: *See—*
Matsumoto, Tadashi; Kuratani, Osamu; Hirose, Yasunori; and Toba, Susumu, 4,345,102, Cl. 568-678.000.
Marvin Glass & Associates: *See—*
Erickson, Erick E.; and Licitis, Gunars, Sr., 4,344,346, Cl. 84-1.180.
Marvin, Mark C. Underwater breathing device. 4,344,427, Cl. 128-200.250.
Marwick, Edward F. Contained nuclear explosion breeder reactor system. 4,344,913, Cl. 376-317.000.
Maryschka, Gerhard, to U.S. Philips Corporation. Recording and/or reproducing apparatus. 4,345,283, Cl. 360-96.600.
Masaki, Kenji, to Nissan Motor Company, Limited. Electrostatic fuel injector. 4,344,401, Cl. 123-536.000.
Maschinenfabrik Korfmann GmbH: *See—*
Mittelkotter, Alfred, 4,344,357, Cl. 98-50.000.
Massie, Norbert A., to Rockwell International Corporation. Modal sensor. 4,344,707, Cl. 356-354.000.
Masterson, Robert C., Jr.; Thomas, R. Gordon; and Johnson, John G., to Air Rail, Inc. Air suspension system for piggyback transportation of goods. 4,344,656, Cl. 303-2.000.
Matrix Unlimited, Inc.: *See—*
Kress, David R., 4,345,022, Cl. 430-329.000.
Matsuda, Tetsuo: *See—*
Sakakibara, Hideo; Fujiwara, Tatsuro; Okegawa, Osamu; Honda, Eiichi; Watanabe, Susumu; and Matsuda, Tetsuo, 4,345,069, Cl. 536-7.100.
Matsui, Kazuma: *See—*
Hattori, Yoshiyuki; Matsui, Kazuma; and Kinbara, Hiroji, 4,344,338, Cl. 74-752.00C.
Matsui, Kiyoshi: *See—*
Tanabe, Tetsuo; Takamori, Kazumi; Matueda, Akira; Matsui, Kiyoshi; Omura, Junichi; and Miyamoto, Hitoshi, 4,344,219, Cl. 29-564.600.
Matsui, Takao: *See—*
Kawazoe, Shozo; Matsui, Takac; and Moriuchi, Takahiko, 4,345,000, Cl. 428-212.000.
Matsui, Takeshi: *See—*
Idogaki, Takaharu; Kawai, Hisasi; Matsui, Takeshi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,345,228, Cl. 335-222.000.
Matsuki, Yutaka: *See—*
Hoki, Tsuneo; and Matsuki, Yutaka, 4,345,041, Cl. 521-94.000.
Matsumiya, Ritsuo; and Osawa, Mitsuaki, to M. Setek Company Limited. Apparatus for applying photo resist on both surfaces of semiconductor wafer. 4,344,380, Cl. 118-66.000.

Matsumoto, Hiroshi; and Ogura, Tomoki, to Tokyo Shibaura Denki Kabushiki Kaisha. Copying machine. 4,344,697, Cl. 355-14.00C.

Matsumoto, Tadashi; Kuratani, Osamu; Hirose, Yasunori; and Toba, Susumu, to Maruzen Oil Co., Ltd. Process for producing ethylene glycol mono-t-butyl ether. 4,345,102, Cl. 568-678.000.

Matsumoto, Toshiaki: *See*—
Ishida, Tokuji; Taniguchi, Nobuyuki; Itoh, Masatoshi; Matsumoto, Toshiaki; Izumi, Tatsuro; and Niwa, Masatake, 4,344,680, Cl. 354-33.000.

Matsumoto, Yoshiro: *See*—
Kunitake, Tatsuro; Ohtani, Hiroo; Watanabe, Seiichi; Takigawa, Toshiji; and Matsumoto, Yoshiro, 4,344,801, Cl. 148-3.000.

Matsumura, Toshimi; Omori, Norio; and Yamazoe, Hisamitsu, to Nippondenso Co., Ltd. Method and apparatus for controlling engine idling speed. 4,344,399, Cl. 123-339.000.

Matsuoka, Hiromasa; Azuma, Kenkoku; and Nishiyama, Enju, to Mitsubishi Denki Kabushiki Kaisha. Water producing apparatus. 4,344,778, Cl. 55-180.000.

Matsuoka, Shigeru: *See*—
Suzuki, Mitsuo; Tokunaga, Takeshi; Yonekura, Seiji; Matsuoka, Shigeru; and Nakamura, Kenji, 4,344,252, Cl. 49-199.000.

Matsushima, Noriaki; and Nemoto, Shigeru, to Sumitomo Durez Company, Ltd. Resol phenolic resin binder for hot coating of foundry sand. 4,345,003, Cl. 428-327.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Ogawa, Kazufumi; Chikamura, Takao; and Shibata, Takuo, 4,345,021, Cl. 430-321.000.
Tanabe, Tetsuo; Takamori, Kazumi; Matueda, Akira; Matsui, Kiyoshi; Omura, Junichi; and Miyamoto, Hitoshi, 4,344,219, Cl. 29-564.600.
Tanaka, Junzo; and Orita, Masatomo, 4,345,134, Cl. 219-10.55B.

Matsuura, Toshiharu: *See*—
Inoue, Tokuta; Nakanishi, Kiyoshi; Kanda, Mutsumi; Nakada, Masahiko; and Matsuura, Toshiharu, 4,344,408, Cl. 123-661.000.

Matsuzaki, Minoru, to Kawasaki Steel Corporation. Process for preventing growth of fishtails during slabbing. 4,344,309, Cl. 72-199.000.

Matthies, Alan A., to Eaton Corporation. Manual switch with timed electro-thermal latch release. 4,345,233, Cl. 337-75.000.

Matueda, Akira: *See*—
Tanabe, Tetsuo; Takamori, Kazumi; Matueda, Akira; Matsui, Kiyoshi; Omura, Junichi; and Miyamoto, Hitoshi, 4,344,219, Cl. 29-564.600.

Matushima, Yasuo: *See*—
Sato, Takashi; Tsuchiya, Tomio; and Matushima, Yasuo, 4,345,114, Cl. 179-6.160.

Maurer, Fritz: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Hammann, Ingeborg; and Stendel, Wilhelm, 4,345,078, Cl. 544-244.000.

Maurer, Siegfried. Processing chamber, in particular smoking chamber. 4,344,358, Cl. 99-476.000.

Mauries, Reinhard: *See*—
Rohner, Joachim; Zumfeld, Heinz; and Mauries, Reinhard, 4,344,277, Cl. 57-22.000.

Mauthe, Gerhard: *See*—
Czech, Franz; Mauthe, Gerhard; and Pfrotzschner, Hans, 4,345,129, Cl. 200-163.000.

May, Kenneth D.; and Bell, John T., to Container Corporation of America. Apparatus for accumulating and stacking articles. 4,344,523, Cl. 198-424.000.

Mayer, William R.; and Runion, Alton E. Rectangular headlamp retainer. 4,345,307, Cl. 362-306.000.

Mayr, Erwin, to Zahnraderfabrik Renk A.G. Tilt drive coupling for steel making converter. 4,344,608, Cl. 266-245.000.

McCandlish, Larry E.; Wright, Franklin J.; and Kugler, Edwin L., to Exxon Research & Engineering Co. CO Hydrogenation process using steam and molybdenum oxycarbonitride catalyst. 4,345,038, Cl. 518-711.000.

McDonnell Douglas Corporation: *See*—
Smith, Dale A., 4,344,264, Cl. 52-247.000.

McFadden, Arthur R.; and Aultz, Daniel E., to American Hoechst Corporation. Process for preparing heteroarylbenzoxepin-acetic acids, precursors and derivatives thereof. 4,345,087, Cl. 549-44.000.

McFarlane, Peter: *See*—
Duff, John; and McFarlane, Peter, 4,344,353, Cl. 91-165.000.

McGill, Terry J.: *See*—
Smith, W. Christen; McGill, Terry J.; and Spangler, Herbert L., 4,344,370, Cl. 110-162.000.

McIlvin, Donald B.: *See*—
Bouzianis, George J.; Hollick, John G.; McIlvin, Donald B.; and Sillars, Frederick S., 4,344,199, Cl. 12-54.300.

McIntosh, Walter L., to Log Etronics, Inc. Exposure and contrast determination by prescanning in electronic photoprinting systems. 4,344,699, Cl. 355-20.000.

McLaren, Edwin C., to Champion International Corporation. Apparatus for heat sealing round containers. 4,344,814, Cl. 156-581.000.

McLeod, John: *See*—
Howie, James B.; and McLeod, John, 4,345,330, Cl. 372-29.000.

McNeilab, Inc.: *See*—
Rasmussen, Chris R., 4,345,083, Cl. 546-163.000.

McQueen, Sidney J. Trigger mechanism providing a short burst of fire capability for submachine guns. 4,344,351, Cl. 89-129.00B.

McVeigh, James J.: *See*—
Jamison, Warren E.; and McVeigh, James J., 4,344,278, Cl. 57-221.000.

Mechanical Technology Incorporated: *See*—
Winn, Leo W., 4,344,631, Cl. 277-29.000.

Meddings, Basil; and Kaiser, Heinz, to Sherritt Gordon Mines Limited. Cross-flow nebulizer. 4,344,574, Cl. 239-338.000.

Medtronic, Inc.: *See*—
Markowitz, H. Toby, 4,344,437, Cl. 128-419.0PG.

Meier, Wayne R.: *See*—
Maniscalco, James A.; and Meier, Wayne R., 4,344,911, Cl. 376-102.000.

Meinan Machinery Works, Inc.: *See*—
Ibuki, Yasuhiro, 4,344,471, Cl. 144-345.000.

Meka S.N.C. di P. Merati & C.: *See*—
Cagnazzi, Ernesto, 4,344,535, Cl. 206-581.000.

Melamud, Robert C.; Nihart, James D.; and White, James M., to International Business Machines Corporation. Dynamic threshold device. 4,345,314, Cl. 364-515.000.

Melcher, Franz-Josef: *See*—
Knothe, Erich; Berg, Christoph; and Melcher, Franz-Josef, 4,344,494, Cl. 177-210.00R.

Melillo, David G.: *See*—
Liu, Thomas M. H.; Melillo, David G.; Ryan, Kenneth M.; Shinkai, Ichiro; and Sletzinger, Meyer, 4,344,885, Cl. 549-291.000.

Mellor, James R.: *See*—
Bamford, Charles R.; Mellor, James R.; and Parker, Bernard, 4,345,036, Cl. 501-37.000.

Melton, James D. Energy efficient distillation apparatus. 4,344,828, Cl. 203-19.000.

Melvin, Wilbert, Jr.: *See*—
Sterling, Larry D.; and Melvin, Wilbert, Jr., 4,344,197, Cl. 8-150.000.

Membrain Limited: *See*—
Thompson, Brett A.; Webb, John A.; and White, Martin B., 4,345,201, Cl. 324-52.000.

Menashi, Wilson P.: *See*—
Moxon, Edwin C.; and Menashi, Wilson P., 4,344,315, Cl. 374-44.000.

Merck & Co., Inc.: *See*—
Liu, Thomas M. H.; Melillo, David G.; Ryan, Kenneth M.; Shinkai, Ichiro; and Sletzinger, Meyer, 4,344,885, Cl. 549-291.000.

Merl, Milton J., to Coca-Cola Company, The. Modular product display system. 4,344,367, Cl. 108-1.000.

Merz, Johann, to Zahnradfabrik Friedrichshafen, AG. Means for mutual positioning of members. 4,344,717, Cl. 403-14.000.

Messerschmitt-Boelkow-Blohm GmbH: *See*—
Derschmidt, Hans; and Frommlet, Hubert, 4,344,739, Cl. 416-141.000.

Metabi, Tsuneyo, to Minolta Camera Kabushiki Kaisha. Interchangeable lens assembly. 4,344,688, Cl. 354-272.000.

Metzger, Karl G.: *See*—
Niemers, Ekkehard; Konig, Hans-Bodo; Schrock, Wilfried; and Metzger, Karl G., 4,344,939, Cl. 424-226.000.
Niemers, Ekkehard; Konig, Hans-Bodo; Schrock, Wilfried; and Metzger, Karl G., 4,344,955, Cl. 424-271.000.

Meyer, James A., to United States of America, Energy. Fast-acting valve and uses thereof. 4,344,449, Cl. 137-1.000.

Meyers, Peter V.: *See*—
Fulop, Gabor F.; Betz, Jacob F.; Meyers, Peter V.; and Doty, Mitchell E., 4,345,107, Cl. 136-255.000.

Michel, John M., to Woodstream Corporation. Detachable latch. 4,344,646, Cl. 292-87.000.

Mieth, Hans O. E.: *See*—
Tuchenhagen, Otto A. P.; Mieth, Hans O. E.; and Coura, Herbert R., 4,344,453, Cl. 137-240.000.

Mignien, Georges; and Gauthier, Francis, to Compagnie Lyonnaise de Transmissions Optique. Method of welding several optical fibers end to end in layers and a device for welding in accordance with said method. 4,345,137, Cl. 219-121.0PK.

Mikami, Junji: *See*—
Asano, Shiro; Shizuka, Kohei; Kambara, Yoshihiko; Mikami, Junji; Kato, Hiroshi; and Honda, Tadatoshi, 4,345,101, Cl. 564-206.000.

Miki, Isao; Kishihara, Takeshi; Kawai, Toshiyuki; and Furumaki, Naoyuki, to Nippon Light Metal Co., Ltd. Method of die casting a metallic cast product having a metallic hollow member embedded therein. 4,344,477, Cl. 164-98.000.

Mikina, Stanley J. Variable speed transmission. 4,344,333, Cl. 74-199.000.

Miko, Sandor: *See*—
Gries, Robert J.; Miko, Sandor; and Conn, Calvin E., 4,345,188, Cl. 315-411.000.

Milatz, Erhard; and Schmidt, Hans, to Robot Foto & Electronic GmbH & Co. K.G. Photographic cameras. 4,344,685, Cl. 354-173.000.

Milford, Alan H.; and Proulx, Oliver J., to Olin Corporation. Process for manufacturing flexible densified polymethane foam. 4,344,902, Cl. 264-51.000.

Miller, Fred R. Revolver crane barrel extender and alignment tool. 4,344,245, Cl. 42-1.00R.

Miller, G. Kirby: *See*—
Becker, Jon; Miller, G. Kirby; and Burney, Charles F., 4,344,810, Cl. 156-379.700.

Mills Products, Inc.: *See*—
Katona, Joseph W., 4,344,217, Cl. 29-417.000.

Milner, David J.: *See*—
Laidler, Dale A.; and Milner, David J., 4,344,894, Cl. 260-465.00D.

Milsco Manufacturing Company: *See*—
Eimen, Shawn H., 4,344,597, Cl. 248-561.000.

Minakawa, Yoshimitsu; Ishibashi, Yoji; Sato, Isao; Uchiyama, Yoshihiro; and Takahashi, Kazuyoshi, to Hitachi, Ltd. Combustor of gas turbine. 4,344,280, Cl. 60-39009.00F.
Minato, Shoji: *See—*
Godai, Tomokazu; Minato, Shoji; Nishimura, Katushi; and Ogawa, Tsuneshi, 4,345,140, Cl. 219-146.230.
Minnesota Mining and Manufacturing Company: *See—*
Nelson, Robert L.; and Downing, Michael W., 4,345,028, Cl. 435-30.000.
Minnick, L. John, to Minnick, L. John. Cementitious compositions and aggregate derivatives from said compositions. 4,344,796, Cl. 106-84.000.
Minolta Camera Kabushiki Kaisha: *See—*
Ishida, Tokuji; Taniguchi, Nobuyuki; Itoh, Masatoshi; Matsumoto, Toshiaki; Izumi, Tatsuro; and Niwa, Masatake, 4,344,680, Cl. 354-33.000.
Metabi, Tsuneyo, 4,344,688, Cl. 354-272.000.
Murata, Tomoji; Goto, Yasuo; and Hayashi, Masamichi, 4,344,696, Cl. 355-8.000.
Oka, Tateki; Tabuchi, Kenji; and Tanaka, Susumu, 4,345,014, Cl. 430-122.000.
Yamada, Seiji, 4,344,681, Cl. 354-38.000.
Minor, John M.: *See—*
Craig, Ernest M.; and Minor, John M., 4,345,143, Cl. 219-411.000.
Minor, Robert N.; and Cloutier, Edward J. F., to Gasaver Corp. Fuel saver. 4,344,406, Cl. 123-587.000.
Mirtich, Michael J.: *See—*
Banks, Bruce A.; Mirtich, Michael J.; and Sovey, James S., 4,344,996, Cl. 428-141.000.
Missig, James R.: *See—*
Tyree, Lewis, Jr.; Missig, James R.; and Rhoades, George D., 4,344,291, Cl. 62-62.000.
Mitchell, Thomas O., to Mobil Oil Corporation. Coal conversion catalysts. 4,344,838, Cl. 208-10.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Komuro, Keigo; Yamada, Matsuichi; Aoki, Katsuhiko; Yoshikawa, Yoshihiko; Itoh, Fumio; Takeda, Fumio; and Ishida, Osami, 4,345,255, Cl. 343-100.0PE.
Matsuoka, Hiromasa; Azuma, Kenkoku; and Nishiyama, Enju, 4,344,778, Cl. 55-180.000.
Saito, Masato; Tsuchihashi, Michihiro; Takai, Yoshinori; Fukuyama, Keiji; and Watanabe, Keiji, 4,345,186, Cl. 315-49.000.
Takase, Akio; Horikoshi, Hiroshi; and Kasada, Toshio, 4,345,132, Cl. 219-10.55B.
Mitsubishi Paper Mills, Ltd.: *See—*
Kohmura, Isao, 4,345,019, Cl. 430-234.000.
Mitsui Coke Co., Ltd.: *See—*
Komiyama, Tadashi; Oi, Shoichi; Ohnishi, Noriaki; Mori, Shinya; Takata, Tadanobu; and Kubo, Isao, 4,344,837, Cl. 208-8.0LE.
Mitsui Petrochemical Industries, Ltd.: *See—*
Takeda, Nobuyuki; and Iwata, Tadao, 4,345,054, Cl. 525-480.000.
Mitsui Toatsu Chemicals, Inc.: *See—*
Asano, Shiro; Shizuka, Kohei; Kambara, Yoshihiko; Mikami, Junji; Kato, Hiroshi; and Honda, Tadatoshi, 4,345,101, Cl. 564-206.000.
Mittelkotter, Alfred, to Ruhrkohle AG; and Maschinenfabrik Korfmann GmbH. Apparatus for extending ventilating conduits. 4,344,357, Cl. 98-50.000.
Mittendorf, Gerald C.: *See—*
Schuster, Robert W.; and Mittendorf, Gerald C., 4,344,281, Cl. 60-39.28R.
Miura, Noriyoshi. Cigarette holder with nicotine extractor. 4,344,444, Cl. 131-201.000.
Miyakawa, Seii; Kawauchi, Akira; Iijima, Kazunori; Terayama, Takao; Yoshida, Masashi; and Kawase, Hideyuki, to Hitachi, Ltd. Apparatus for bringing wire-shaped or tape-shaped carrier into contact with carrier guide member. 4,345,282, Cl. 360-85.000.
Miyamoto, Hitoshi: *See—*
Tanabe, Tetsuo; Takamori, Kazumi; Matueda, Akira; Matsui, Kiyoshi; Omura, Junichi; and Miyamoto, Hitoshi, 4,344,219, Cl. 29-564.600.
Miyata, Nobuyoshi; and Murase, Heihachi, to Hercules Incorporated. Process for forming a coated film of an olefinic resin. 4,345,004, Cl. 428-416.000.
Miyazaki, Kunio: *See—*
Kurata, Noboru; Miyazaki, Kunio; and Yamamoto, Kuniyuki, 4,344,500, Cl. 180-230.000.
Mizokami, Kazunori, to Olympus Optical Co., Ltd. Diaphragm control device for camera. 4,344,678, Cl. 354-23.00D.
Mizutani, Masashi; and Nakamura, Shiro, to Yamaha Hatsudoki Kabushiki Kaisha. Ignition timing control means for internal combustion engines. 4,344,391, Cl. 123-146.50A.
Mobay Chemical Corporation: *See—*
Sanns, Frank, Jr., 4,344,892, Cl. 260-453.0AM.
Mobil Oil Corporation: *See—*
All, Frank E.; and Duncan, Gary L., 4,345,005, Cl. 428-461.000.
Chang, Clarence D.; and Lang, William H., 4,344,868, Cl. 252-455.00Z.
Chen, Albert C., 4,344,982, Cl. 427-44.000.
Herrington, Fox J., 4,344,907, Cl. 264-173.000.
Johnson, D. Emil; Krutchen, Charles M.; and Sharps, G. Vincent, Jr., 4,344,710, Cl. 366-76.000.
Mitchell, Thomas O., 4,344,838, Cl. 208-10.000.
Moehrmann, Karl-Heinz: *See—*
Barabas, Udo; Moehrmann, Karl-Heinz; and Christiansen, Hans-Marlin, 4,345,273, Cl. 358-86.000.
Mohr, Reinhard; and Hahnke, Manfred, to Hoechst Aktiengesellschaft. Quaternary and basic azamethine compounds and their use as colorants. 4,344,879, Cl. 260-146.00R.
Molex Incorporated: *See—*
Ditzig, Albert F., 4,344,224, Cl. 29-622.000.
Molins Limited: *See—*
Bennett, David S.; and Hoath, Grantley R., 4,344,521, Cl. 198-404.000.
Czoch, Jerzy W.; and Seagrove, Douglas J. W., 4,344,520, Cl. 198-347.000.
Molins Machine Company, Inc.: *See—*
Roberts, Webster C., 4,344,379, Cl. 118-44.000.
Molnar, Albert E.; and Molnar, William J. Baseball equipment cabinet. 4,344,660, Cl. 312-250.000.
Molnar, William J.: *See—*
Molnar, Albert E.; and Molnar, William J., 4,344,660, Cl. 312-250.000.
Moniterm Corporation: *See—*
Casper, Clarence, Jr., 4,345,187, Cl. 315-408.000.
Moniz, William B.: *See—*
Bertrand, Richard D.; Chingas, Gerard C.; Garroway, Allen N.; and Moniz, William B., 4,345,207, Cl. 324-308.000.
Monjoie, Michel W. J. P. R., to Hamon Sobelco, S.A. Fill sheets for gas and liquid contact apparatus. 4,344,899, Cl. 261-112.000.
Monkhouse, Donald C.: *See—*
Chow, Wing-Sun; and Monkhouse, Donald C., 4,344,940, Cl. 424-241.000.
Monsanto Company: *See—*
Sung, Joseph P., 4,345,205, Cl. 324-65.00R.
Monsheimer, Rolf; and Pfleiderer, Ernst, to Rohm GmbH. Soaking method. 4,344,762, Cl. 8-94.180.
Montgomery, Carroll S.: *See—*
Mueller, Michael J.; and Montgomery, Carroll S., 4,345,094, Cl. 562-425.000.
Mueller, Michael J.; and Montgomery, Carroll S., 4,345,095, Cl. 562-425.000.
Moore, Jerry D.: *See—*
Pilat, Howard L.; Moore, Jerry D.; and Chosnek, Jack, 4,345,093, Cl. 560-205.000.
Moore, Leo M. Integral heater follower plate. 4,344,547, Cl. 222-146.0HE.
Moore, Sanders H.: *See—*
Wright, David B.; Moore, Sanders H.; and Kircher, Morton S., 4,344,833, Cl. 204-258.000.
Morabito, Joseph M.: *See—*
Bulger, Gary A.; Heck, Lyle D.; Huttemann, Robert D.; Morabito, Joseph M.; Pitetti, Raymond C.; Unger, Burton A.; and Vallere, Donald J., 4,344,223, Cl. 29-577.00C.
Mori, Shinya: *See—*
Komiyama, Tadashi; Oi, Shoichi; Ohnishi, Noriaki; Mori, Shinya; Takata, Tadanobu; and Kubo, Isao, 4,344,837, Cl. 208-8.0LE.
Morita, Riyozo; and Honjyo, Yutaka, to Kabushiki Kaisha Meiki Seisakusho. Apparatus for reclaiming and recycling thermosetting scrap. 4,344,579, Cl. 241-34.000.
Morita, Shigeru, to Nippon Flute Co., Ltd. Device for feeding plate materials. 4,344,611, Cl. 271-129.000.
Moritani, Masahiko: *See—*
Kitagawa, Yoshihiko; Yuyama, Masahiro; Moritani, Masahiko; and Suzuki, Mikio, 4,344,906, Cl. 264-128.000.
Moriuchi, Takahiko: *See—*
Kawazoe, Shozo; Matsui, Takao; and Moriuchi, Takahiko, 4,345,000, Cl. 428-212.000.
Morrow, Willie L. Double twist hair roller. 4,344,447, Cl. 132-42.00R.
Motorola, Inc.: *See—*
Allen, Gordon H.; and Neidorff, Robert A., 4,345,166, Cl. 307-296.00R.
Ho, Roland K., 4,345,299, Cl. 361-283.000.
Latasiewicz, Leonard, 4,345,119, Cl. 200-5.00A.
Pace, W. David, 4,345,217, Cl. 330-288.000.
Skalka, Robert J., 4,345,206, Cl. 324-79.00R.
Motoyama, Kazuyasu: *See—*
Kanayama, Katsumi; Furuta, Kenzi; and Motoyama, Kazuyasu, 4,345,286, Cl. 360-137.000.
Mouyard, Arthur A.; Hamby, Michael V.; and Tomaszek, Paul A., to General Instrument Corporation. Alpha-numeric display array and method of manufacture. 4,345,308, Cl. 362-332.000.
Moxon, Edwin C.; and Menashi, Wilson P., to Ceres Electronics Corporation. Method and device for distinguishing material by thermal conductivity. 4,344,315, Cl. 374-44.000.
Moyer, Robert W.: *See—*
Remington, John L.; and Moyer, Robert W., 4,344,368, Cl. 108-51.100.
Mrongowius, Klaus: *See—*
Stratmann, Josef; and Mrongowius, Klaus, 4,344,823, Cl. 201-41.000.
MSI Data Corporation: *See—*
Cadotte, Ernest R.; and Hester, Gerald P. (said Gerald P. Hester assors. to), 4,345,315, Cl. 364-900.000.
MTS Systems Corporation: *See—*
Langer, William J., 4,344,324, Cl. 73-146.000.
Muacevic, Gojko: *See—*
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Muacevic, Gojko; and Traunecker, Werner, 4,344,964, Cl. 424-304.000.
Muchowski, Joseph M., to Syntex (U.S.A.) Inc. 6-Chloro- or 6-bromo-1,2-dihydro-3H-pyrrolo[1,2-a]-pyrrole-1-carboxylic acids and derivatives thereof. 4,344,943, Cl. 424-245.000.

Mueller, Michael J.; and Montgomery, Carroll S., to American Cyanamid Company. Process for the production of 6-hydroxy-2-naphthoic acid. 4,345,094, Cl. 562-425.000.

Mueller, Michael J.; and Montgomery, Carroll S., to American Cyanamid Company. Process for the production of 6-hydroxy-2-naphthoic acid. 4,345,095, Cl. 562-425.000.

Mueller, Paul: *See*—
Grote, Hugo; Hasselmann, Heinz; Kunze, Volkmar; Zacharias, Karl; Kuelpmann, Robert; and Mueller, Paul, 4,344,515, Cl. 192-67.00R.

Mullane, John C., Jr.: *See*—
Boyle, John F.; Halper, Barry J.; Link, James C.; and Mullane, John C., Jr., 4,344,290, Cl. 62-48.000.

Muller, Hans: *See*—
Jeschke, Willi; and Muller, Hans, 4,344,610, Cl. 270-6.000.

Muller, Jakob; and Diesner, Ferdinand, to Textilma AG. Ribbon-type fabric and method of making. 4,344,463, Cl. 139-383.00R.

Mumcu, Salih; and Panoch, Hans J., to Chemische Werke Huls AG. Method for the preparation of polyether ester amides. 4,345,052, Cl. 525-411.000.

Mumcu, Salih, to Chemische Werke Huls AG. Preparation of polyether ester amides. 4,345,064, Cl. 528-288.000.

Murai, Shigeo: *See*—
Nishiyama, Ryuzo; Haga, Takahiro; Toki, Tadaaki; Koyanagi, Tohru; and Murai, Shigeo, 4,344,951, Cl. 424-263.000.

Murase, Heihachi: *See*—
Miyata, Nobuyoshi; and Murase, Heihachi, 4,345,004, Cl. 428-416.000.

Murata, Tomoji; Goto, Yasuo; and Hayashi, Masamichi, to Minolta Camera Kabushiki Kaisha. Means for driving reciprocating members. 4,344,696, Cl. 355-8.000.

Murooka, Rikichi: *See*—
Takeuchi, Sumio; Murooka, Rikichi; and Sakamoto, Jun, 4,345,241, Cl. 340-347.0CC.

Murphy, Eugene F.: *See*—
Aaron, Robert L.; and Murphy, Eugene F., 4,345,147, Cl. 235-385.000.

Murphy, Raymond J. Crossarm including cable rewinding means for supported gymnastic equipment. 4,344,617, Cl. 272-109.000.

Murray, Donald L., to Allis-Chalmers Corporation. Auto-sampler and feed chute for an asphalt plant. 4,344,519, Cl. 193-2.00R.

Mussman, Harry E.: *See*—
Davis, James A.; MacPherson, William F.; Mussman, Harry E.; and Shackle, Peter W., 4,345,163, Cl. 307-252.00A.

Myers, Mark E., Jr.: *See*—
Nagy, Louis L.; and Myers, Mark E., Jr., 4,345,202, Cl. 324-58.50B.

Myo-Tronics Research, Inc.: *See*—
Radke, John C., 4,344,441, Cl. 128-733.000.

Naarmann, Herbert: *See*—
Blinne, Gerd; Naarmann, Herbert; and Penzien, Klaus, 4,344,869, Cl. 252-517.000.
Blinne, Gerd; Naarmann, Herbert; and Penzien, Klaus, 4,344,870, Cl. 252-517.000.

Nabeta, Teiichi: *See*—
Fujiwara, Toshitaka; Nabeta, Teiichi; Akita, Sigeyuki; and Kitagawa, Junji, 4,344,293, Cl. 62-126.000.

Naffa, Faisal A., to Brooks & Perkins, Incorporated. Cargo handling apparatus. 4,344,726, Cl. 410-79.000.

Nagae, Hiromitsu: *See*—
Sawada, Hiroji; Igawa, Tatsuo; and Nagae, Hiromitsu, 4,345,120, Cl. 200-19.00R.

Nagano Electronics Industrial Co., Ltd.: *See*—
Ogiwara, Kesami, 4,344,260, Cl. 51-283.00E.

Nagasaki, Michisuke; and Aso, Kinichi, to Yanmar Diesel Engine Co., Ltd. Reduction and reversing gear for marine propulsion systems. 4,344,337, Cl. 74-740.000.

Nagata, Satoshi: *See*—
Hirotani, Tatsushi; and Nagata, Satoshi, 4,345,316, Cl. 364-900.000.

Naguib, Moustafa M.: *See*—
Curiel, Georg; and Naguib, Moustafa M., 4,344,289, Cl. 60-612.000.

Nagumo, Fumio; and Asaida, Takashi, to Sony Corporation. Solid state digital television camera. 4,345,270, Cl. 358-44.000.

Nagura, Kenji; Takeda, Shinichi; Namie, Koshi; Fujii, Takao; Yamamoto, Michio; and Yokoyama, Seiichi, to Hercofina. Recovery of aromatic carboxylic acid or ester thereof from residue fraction of oxidation or esterification reaction mixture. 4,345,089, Cl. 560-77.000.

Nagy, Geza T.; Szepesi, Gabor; and Gazdag, Maria, to Richter Gedeon Vegyeszeti Gyar Rt. Parenteral solvent and a process for the preparation of stable solutions containing same. 4,344,950, Cl. 424-262.000.

Nagy, Louis L.; and Myers, Mark E., Jr., to General Motors Corporation. Method of detecting soot in engine oil using microwaves. 4,345,202, Cl. 324-58.50B.

Nakada, Akira; Sugiura, Toshio; Okamoto, Eisaku; and Yoshida, Kiyoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument having musical performance training system. 4,344,344, Cl. 84-1.030.

Nakada, Masahiko: *See*—
Inoue, Tokuta; Nakanishi, Kiyoshi; Kanda, Mutsumi; Nakada, Masahiko; and Matsuura, Toshiharu, 4,344,408, Cl. 123-661.000.

Nakamizo, Nobuhiro: *See*—
Takai, Haruki; Teranishi, Masayuki; Nakamizo, Nobuhiro; Kasuya, Yutaka; and Kubo, Kazuhiro, 4,344,948, Cl. 424-251.000.

Nakamura, Akira; and Nakaya, Takao, to Nippon Gakki Seizo Kabushiki Kaisha. Diaphragm for electro-acoustic transducer. 4,344,503, Cl. 181-170.000.

Nakamura, Kenji: *See*—
Suzuki, Mitsuo; Tokunaga, Takeshi; Yonekura, Seiji; Matsuoka, Shigeru; and Nakamura, Kenji, 4,344,252, Cl. 49-199.000.

Nakamura, Kousuke: *See*—
Asai, Tadamichi; and Nakamura, Kousuke, 4,345,179, Cl. 313-136.000.

Nakamura, Shiro: *See*—
Mizutani, Masashi; and Nakamura, Shiro, 4,344,391, Cl. 123-146.50A.

Nakamura, Takeshi; and Tanaka, Akihiko, to Nippon Seiko Kabushiki Kaisha. Clutch release device. 4,344,517, Cl. 192-98.000.

Nakamura, Tsutomu: *See*—
Kuroda, Akira; Nakamura, Tsutomu; and Onishi, Masatoshi, 4,345,042, Cl. 521-112.000.

Nakanishi, Kiyoshi: *See*—
Inoue, Tokuta; Nakanishi, Kiyoshi; Kanda, Mutsumi; Nakada, Masahiko; and Matsuura, Toshiharu, 4,344,408, Cl. 123-661.000.

Nakaya, Takao: *See*—
Nakamura, Akira; and Nakaya, Takao, 4,344,503, Cl. 181-170.000.

Namie, Koshi: *See*—
Nagura, Kenji; Takeda, Shinichi; Namie, Koshi; Fujii, Takao; Yamamoto, Michio; and Yokoyama, Seiichi, 4,345,089, Cl. 560-77.000.

Nasser, Karim W., to Canadian Patents & Development Ltd. Method and apparatus for indicating the air content of concrete in situ. 4,344,316, Cl. 73-19.000.

Nati, Salvatore F., Jr.: *See*—
Bedard, James F.; Eichelberger, Charles W.; and Nati, Salvatore F., Jr., 4,345,200, Cl. 323-350.000.

Natico, Inc.: *See*—
Dry, Sidney, 4,344,546, Cl. 220-320.000.

National Semiconductor Corporation: *See*—
Congdon, James S.; and Isbell, Tim D., 4,345,218, Cl. 330-298.000.

Naumann, Klaus; and Rauchschwalbe, Rudolf, to Bayer Aktiengesellschaft. Process for preparing menthyl esters of enantiomers of chiral 3-(2,2-dichloro- and -dibromo-vinyl)-2,2-dimethylcyclopropanecarboxylic acids. 4,345,090, Cl. 560-124.000.

Naumann, Klaus: *See*—
Fuchs, Rainer; Naumann, Klaus; Lantzsch, Reinhard; Hagemann, Hermann; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,344,960, Cl. 424-282.000.

NCR Corporation: *See*—
Reitberger, Peter H., 4,345,259, Cl. 346-75.000.

Neeff, Rutger: *See*—
Auge, Wolfgang; Thelen, Bernd; Thiem, Karl-Werner; and Neeff, Rutger, 4,344,827, Cl. 203-13.000.

Negi, Shigeto: *See*—
Machida, Yoshimasa; Saito, Isao; Nomoto, Seiichiro; Negi, Shigeto; Ikuta, Hironori; and Kitoh, Kyosuke, 4,344,944, Cl. 424-246.000.

Neidorff, Robert A.: *See*—
Allen, Gordon H.; and Neidorff, Robert A., 4,345,166, Cl. 307-296.00R.

Nelson, Marvin D., to Honeywell Inc. Capacitive humidity transducer. 4,345,301, Cl. 361-400.000.

Nelson, Robert L.; and Downing, Michael W., to Minnesota Mining and Manufacturing Company. Bacteria growing device. 4,345,028, Cl. 435-30.000.

Nelson, Ronald E.: *See*—
Rathi, Ram N.; and Nelson, Ronald E., 4,344,497, Cl. 180-41.000.

Nelson, Walter R. Flow control device employing elastomeric element. 4,344,459, Cl. 138-45.000.

Nemoto, Shigeru: *See*—
Matsushima, Noriaki; and Nemoto, Shigeru, 4,345,003, Cl. 428-327.000.

Neubaum, Doris W., administratrix: *See*—
Schwartz, S. Robert; Swan, William E., Jr.; Fetterman, Robert C.; and Neubaum, Victor A., deceased, 4,344,822, Cl. 201-39.000.

Neubaum, Victor A., deceased: *See*—
Schwartz, S. Robert; Swan, William E., Jr.; Fetterman, Robert C.; and Neubaum, Victor A., deceased, 4,344,822, Cl. 201-39.000.

Neuper, Rienhard: *See*—
Suessenbeck, Heinrich; Siebenhofer, Gottfried; Neuper, Rienhard; and Zitz, Alfred, 4,344,354, Cl. 91-168.000.

Newton, Donald O.; and Wilharm, Fred B., to St. Regis Paper Company. Pinch bottom valve bag. 4,344,558, Cl. 229-62.500.

Nezu, Takao; and Turubuchi, Yasuo, to Konishiroku Photo Industry Co., Ltd. Copying machine with retractable stopper. 4,344,703, Cl. 355-76.000.

Nguyen, Tinh: *See*—
Gaul, James M.; and Nguyen, Tinh, 4,344,798, Cl. 106-123.0LC.

Nicholson, Richard R.: *See*—
Smith, Ray E.; Shukla, Jayendra G.; and Nicholson, Richard R., 4,345,002, Cl. 428-288.000.

Nickles, Stephen K.; and Beaird, Suzanne M. T., to Halliburton Company. Apparatus and method for conserving fuel in the operation of a train consist. 4,344,364, Cl. 105-62.00R.

Niemers, Ekkehard; Konig, Hans-Bodo; Schrock, Wilfried; and Metzger, Karl G., to Bayer Aktiengesellschaft. Penicillin 1,1-dioxides, compositions thereof and methods of use. 4,344,939, Cl. 424-226.000.

Niemers, Ekkehard; Konig, Hans-Bodo; Schrock, Wilfried; and Metzger, Karl G., to Bayer Aktiengesellschaft. Penicillin 1,1-dioxides. 4,344,955, Cl. 424-271.000.

Niemeyer, Lutz, to BBC Brown, Boveri & Company, Ltd. High-voltage, blast-actuated power switch having a collapsible contact. 4,345,127, Cl. 200-148.00R.

Nihart, James D.: *See—*
Melamud, Robert C.; Nihart, James D.; and White, James M., 4,345,314, Cl. 364-515.000.
Nihon Parkerizing Co., Ltd.: *See—*
Shimada, Shoji; Sonoda, Sakae; and Yokoyama, Kimio, 4,344,308, Cl. 72-39.000.
Nikles, Erwin; and Karrer, Friedrich, to Ciba-Geigy Corporation. Bicyclo 4-acyloxypiperidine light stabilizers. 4,344,877, Cl. 524-102.000.
Niksa, Andrew J., to Diamond Shamrock Corporation. Gasket for electrolytic cell. 4,344,633, Cl. 277-228.000.
Ninomiya, Hiroshi: *See—*
Aoda, Yukio; Ninomiya, Hiroshi; Yoshida, Kooichi; and Koyanagi, Osamu, 4,344,968, Cl. 424-365.000.
Nippert Company, The: *See—*
Nippert, Russell A., 4,345,136, Cl. 219-120.000.
Nippert, Russell A., to Nippert Company, The. Copper bimetal brazed resistance welding electrode. 4,345,136, Cl. 219-120.000.
Nippon Electric Co., Ltd.: *See—*
Kobayashi, Satoru; and Watanabe, Hiroshi, 4,345,172, Cl. 307-562.000.
Kukaya, Hirokazu; and Kishi, Jun, 4,345,189, Cl. 318-317.000.
Nippon Flute Co., Ltd.: *See—*
Morita, Shigeru, 4,344,611, Cl. 271-129.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Aizawa, Kenshiro; and Okada, Hisashi, 4,345,322, Cl. 369-139.000.
Nakada, Akira; Sugiura, Toshio; Okamoto, Eisaku; and Yoshida, Kiyoshi, 4,344,344, Cl. 84-1.030.
Nakamura, Akira; and Nakaya, Takao, 4,344,503, Cl. 181-170.000.
Nippon Kayaku Kabushiki Kaisha: *See—*
Aoda, Yukio; Ninomiya, Hiroshi; Yoshida, Kooichi; and Koyanagi, Osamu, 4,344,968, Cl. 424-365.000.
Nippon Light Metal Co., Ltd.: *See—*
Miki, Isao; Kishihara, Takeshi; Kawai, Toshiyuki; and Furumaki, Naoyuki, 4,344,477, Cl. 164-98.000.
Nippon Piston Ring Co., Ltd.: *See—*
Onozaki, Teruo, 4,344,634, Cl. 277-236.000.
Nippon Seiko Kabushiki Kaisha: *See—*
Nakamura, Takeshi; and Tanaka, Akihiko, 4,344,517, Cl. 192-98.000.
Nippon Sheet Glass Co., Ltd.: *See—*
Sono, Kenzo; and Kuramoto, Shiyunji, 4,344,988, Cl. 427-255.500.
Nippon Soken, Inc.: *See—*
Fujiwara, Toshitaka; Nabeta, Teiichi; Akita, Sigeyuki; and Kitagawa, Junji, 4,344,293, Cl. 62-126.000.
Hattori, Tadashi; and Ueno, Yoshiki, 4,344,317, Cl. 73-23.000.
Hattori, Yoshiyuki; Matsui, Kazuma; and Kinbara, Hiroji, 4,344,338, Cl. 74-752.00C.
Idogaki, Takaharu; Kawai, Hisasi; Matsui, Takeshi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,345,228, Cl. 335-222.000.
Nippon Steel Corporation: *See—*
Kozono, Haruo; and Higashinaka, Hiroshi, 4,344,310, Cl. 72-225.000.
Nippon Telegraph & Telephone Corporation: *See—*
Uchida, Naoya; Yoshida, Masaaki; and Yamanishi, Toru, 4,344,669, Cl. 350-96.300.
Nippondenso Co., Ltd.: *See—*
Fujiwara, Toshitaka; Nabeta, Teiichi; Akita, Sigeyuki; and Kitagawa, Junji, 4,344,293, Cl. 62-126.000.
Kojima, Yasuhumi; Saito, Atsunori; and Yoshimi, Akiro, 4,344,565, Cl. 236-46.00R.
Matsumura, Toshimi; Omori, Norio; and Yamazoe, Hisamitsu, 4,344,399, Cl. 123-339.000.
Nishimura, Katushi: *See—*
Godai, Tomokazu; Minato, Shoji; Nishimura, Katushi; and Ogawa, Tsuneshi, 4,345,140, Cl. 219-146.230.
Nishimura, Yukuo: *See—*
Shirato, Yoshiaki; Takatori, Yasushi; Hara, Toshitami; Nishimura, Yukuo; and Takahashi, Michiko, 4,345,262, Cl. 346-140.00R.
Nishina, Yasuhide: *See—*
Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, 4,344,981, Cl. 427-40.000.
Nishiyama, Enju: *See—*
Matsuoka, Hiromasa; Azuma, Kenkoku; and Nishiyama, Enju, 4,344,778, Cl. 55-180.000.
Nishiyama, Ryuzo; Haga, Takahiro; Toki, Tadaaki; Koyanagi, Tohru; and Murai, Shigeo, to Ishihara Sangyo Kaisha Ltd. N-Benzoyl N'-pyridyloxy phenyl urea. 4,344,951, Cl. 424-263.000.
Nissan Motor Co., Ltd.: *See—*
Asano, Masaharu, 4,344,400, Cl. 123-425.000.
Etoh, Yukihiro; Tanaka, Toshiaki; Sugasawa, Fukashi; and Iizuka, Haruhiko, 4,344,393, Cl. 123-198.00F.
Iijima, Tamotsu; and Takagi, Yasuo, 4,344,392, Cl. 123-179.00G.
Ikeura, Kenji, 4,344,398, Cl. 123-339.000.
Masaki, Kenji, 4,344,401, Cl. 123-536.000.
Sawada, Hiroji; Igawa, Tatsuo; and Nagae, Hiromitsu, 4,345,120, Cl. 200-19.00R.
Nissen, Axel: *See—*
Horner, Michael; and Nissen, Axel, 4,344,886, Cl. 549-408.000.
Nissim, Joseph, to Rockwell International Corporation. Display apparatus for electronic games. 4,344,622, Cl. 273-85.00G.
Nitto Electric Industrial Co., Ltd.: *See—*
Kawazoe, Shozo; Matsui, Takao; and Moriuchi, Takahiko, 4,345,000, Cl. 428-212.000.
Niwa, Masatake: *See—*
Ishida, Tokuji; Taniguchi, Nobuyuki; Itoh, Masatoshi; Matsumoto, Toshiaki; Izumi, Tatsuro; and Niwa, Masatake, 4,344,680, Cl. 354-33.000.
Nolan, James J.; and Coakley, John E., to Slurry Mining Engineering Inc. Apparatus for actuating downhole flow control valves. 4,344,491, Cl. 175-317.000.
Nomoto, Seiichiro: *See—*
Machida, Yoshimasa; Saito, Isao; Nomoto, Seiichiro; Negi, Shigeto; Ikuta, Hironori; and Kitoh, Kyosuke, 4,344,944, Cl. 424-246.000.
Nomura, Hirokazu: *See—*
Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, 4,344,981, Cl. 427-40.000.
Nordahl, John G., to American Optical Corporation. Reduced-cross talk telemetry system and method of manufacture thereof. 4,345,334, Cl. 455-50.000.
Nordischer Maschinenbau Rud. Baader GmbH & Co. KG: *See—*
Kunig, Helmut, 4,344,208, Cl. 19-129.00R.
Rosenberg, Harald, 4,344,207, Cl. 17-63.000.
Norris, James X.: *See—*
Staples, Jack W.; and Norris, James X., 4,344,296, Cl. 62-175.000.
North, Bernard F., to Sun Chemical Corporation. Glyoxal/cyclic urea condensates. 4,345,063, Cl. 528-245.000.
Norton, James F.; Silagy, Richard J.; and Antoniw, Walter W., to Tuthill Corporation. Coupling assembly. 4,344,455, Cl. 137-329.400.
Norwood, Richard L., to General Electric Company. User programmable control system for toaster oven appliance. 4,345,145, Cl. 219-492.000.
Novak, Lajos; Szantay, Csaba; Rohaly, Janos; Kis-Tamas, Attila; Varjas, Laszlo; and Csutak, Janos, to Egyt Gyogyszervegyeszeti Gyar. Terpene derivatives and insecticidal compositions containing terpenes. 4,344,959, Cl. 424-279.000.
Nowack, Gerhard P.: *See—*
Johnson, Marvin M.; and Nowack, Gerhard P., 4,344,841, Cl. 208-211.000.
Nowakowski, Robert J.: *See—*
Wheadon, Ellis G.; and Nowakowski, Robert J., 4,345,197, Cl. 320-6.000.
Nunes, Anizio G. R., to Automotive Invention Researchers (Pty) Limited. Fuel/air mixing device. 4,344,389, Cl. 123-25.00B.
Nusslein, Ludwig: *See—*
Boroschewski, Gerhard; Nusslein, Ludwig; and Arndt, Friedrich, 4,344,790, Cl. 71-111.000.
Nustep Trenndusen Entwicklungs- und Patentverwertungsgesellschaft mbH & Co. KG: *See—*
Groszstuck, Werner, 4,344,780, Cl. 55-347.000.
Groszstuck, Werner, 4,344,782, Cl. 55-397.000.
Nuttall, David A.; and Hong, Sung H., to Kimberly-Clark Corporation. Air/water hybrid former. 4,344,818, Cl. 162-111.000.
N.V. Raychem S.A.: *See—*
De Blauwe, Francis J. A. M. C., 4,344,909, Cl. 264-230.000.
Nypro Inc.: *See—*
Paradis, Joseph R.; and Kaleskas, Edward W., 4,344,549, Cl. 222-465.00A.
Obase, Hiroyuki: *See—*
Teranishi, Masayuki; Obase, Hiroyuki; Takai, Haruki; Kubo, Kazuhiro; and Kasuya, Yutaka, 4,344,945, Cl. 424-248.520.
Oberhuber, Dieter. Air cushion foil for packaging purposes. 4,344,536, Cl. 206-594.000.
Oberlinner, Andreas: *See—*
Baumann, Hans; and Oberlinner, Andreas, 4,345,073, Cl. 544-70.000.
Occidental Oil Shale, Inc.: *See—*
Ridley, Richard D., 4,344,484, Cl. 166-251.000.
Occidental Research Corporation: *See—*
Schep, Raymond A., 4,345,098, Cl. 562-482.000.
Oce-van der Grinten N.V.: *See—*
Hendriksma, Roelof R.; and VanRhijn, Wilhelmus J., 4,345,015, Cl. 430-137.000.
Oda, Goro, to Tokyo Shibaura Denki Kabushiki Kaisha. Developer transportation device for electrostatic copying machine. 4,344,692, Cl. 355-3.0DD.
Oelke, Erwin S., to Smith International, Inc. Self-lapping high speed seal with wear-in lip. 4,344,629, Cl. 277-1.000.
Ogawa, Kazufumi; Chikamura, Takao; and Shibata, Takuo, to Matsushita Electric Industrial Co., Ltd. Solid-state image pickup element and process for fabricating the same. 4,345,021, Cl. 430-321.000.
Ogawa, Tsuneshi: *See—*
Godai, Tomokazu; Minato, Shoji; Nishimura, Katushi; and Ogawa, Tsuneshi, 4,345,140, Cl. 219-146.230.
Ogawa, Yoshinari: *See—*
Akagi, Noriyuki; Ogawa, Yoshinari; and Sakai, Kouichi, 4,344,874, Cl. 524-296.000.
Ogden, Ralph. Exercise treadmill. 4,344,616, Cl. 272-69.000.
Ogiwara, Kesami, to Nagano Electronics Industrial Co., Ltd.; and Shin-Etsu Chemical Co., Ltd. Method for precision shaping of wafer materials. 4,344,260, Cl. 51-283.00E.
Ognier, Paul; and Guilchier, Bernard, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Connector-locking device. 4,344,663, Cl. 339-75.00M.
Ogura, Tomoki: *See—*
Matsumoto, Hiroshi; and Ogura, Tomoki, 4,344,697, Cl. 355-14.00C.
Ohara, Tamanosuke. Hollow strings containing gelatinous oil. 4,344,279, Cl. 57-232.000.

Ohki, Nobutaka: *See*—
Takahashi, Osamu; Ohki, Nobutaka; and Aoki, Kozo, 4,345,016, Cl. 430-214.000.
Ohkubo, Kiyokazu: *See*—
Iizuka, Yoshitoku; and Ohkubo, Kiyokazu, 4,344,561, Cl. 233-24.000.
Ohkubo, Masanori: *See*—
Sugata, Shigeo; Tachigami, Shigeru; Kikkawa, Satoru; Umezu, Haruo; and Ohkubo, Masanori, 4,345,112, Cl. 174-107.000.
Ohlinger, Manfred: *See*—
Steck, Werner; Sarnecki, Wilhelm; Marosi, Laszlo; Ohlinger, Manfred; and Loeser, Werner, 4,344,791, Cl. 75-0.5AA.
Ohmori, Masayuki: *See*—
Takayama, Hiroaki; Yamada, Sachiko; and Ohmori, Masayuki, 4,344,888, Cl. 260-397.200.
Ohnishi, Noriaki: *See*—
Komiyama, Tadashi; Oi, Shoichi; Ohnishi, Noriaki; Mori, Shinya; Takata, Tadanobu; and Kubo, Isao, 4,344,837, Cl. 208-8.0LE.
Ohno, Susumu: *See*—
Kondo, Tadashige; Ohno, Susumu; Takata, Kenichi; and Inaga, Hisashi, 4,344,395, Cl. 123-335.000.
Ohtani, Hiroo: *See*—
Kunitake, Tatsuro; Ohtani, Hiroo; Watanabe, Seiichi; Takigawa, Toshiji; and Matsumoto, Yoshiro, 4,344,801, Cl. 148-3.000.
Oi, Shoichi: *See*—
Komiyama, Tadashi; Oi, Shoichi; Ohnishi, Noriaki; Mori, Shinya; Takata, Tadanobu; and Kubo, Isao, 4,344,837, Cl. 208-8.0LE.
Oka, Tateki; Tabuchi, Kenji; and Tanaka, Susumu, to Minolta Camera Kabushiki Kaisha. Magnetic brush developing method for use in electrography employing dual-component developing material. 4,345,014, Cl. 430-122.000.
Okada, Hisashi: *See*—
Aizawa, Kenshiro; and Okada, Hisashi, 4,345,322, Cl. 369-139.000.
Okamoto, Eisaku: *See*—
Nakada, Akira; Sugiura, Toshio; Okamoto, Eisaku; and Yoshida, Kiyoshi, 4,344,344, Cl. 84-1.030.
Okegawa, Osamu: *See*—
Sakakibara, Hideo; Fujiwara, Tatsuro; Okegawa, Osamu; Honda, Eiichi; Watanabe, Susumu; and Matsuda, Tetsuo, 4,345,069, Cl. 536-7.100.
Okutomi, Tsutomu; Iida, Masachika; Kuwabara, Kazuyoshi; Yoshino, Hisashi; and Takayanagi, Eiichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrical contact. 4,345,130, Cl. 200-268.000.
Okuzawa, Tugio: *See*—
Kaneko, Tamaki; and Okuzawa, Tugio, 4,344,614, Cl. 271-288.000.
Olander, Donald A. Leather tooling apparatus. 4,344,230, Cl. 30-272.00R.
Olin Corporation: *See*—
Milford, Alan H.; and Proulx, Oliver J., 4,344,902, Cl. 264-51.000.
Wright, David B.; Moore, Sanders H.; and Kircher, Morton S., 4,344,833, Cl. 204-258.000.
Oliver, Kenneth L.: *See*—
Griffith, Carl D.; and Oliver, Kenneth L., 4,345,195, Cl. 318-628.000.
Olsen, Peter R., to Grinnell Lithographic Co., Inc. Fifth panel reclosable package. 4,344,533, Cl. 206-459.000.
Olson, Daniel R., to General Electric Company. UV Curable resins and sulfonate esters of benzotriazoles used in such resins. 4,344,830, Cl. 204-159.160.
Olson, Thomas J.: *See*—
Hammer, Jeffrey M.; and Olson, Thomas J., 4,345,162, Cl. 307-39.000.
Olsson, Nils-Goran E.: *See*—
Hernestam, Sven E. H.; Martinsson, Kjell B.; Christensson, Erik G.; and Olsson, Nils-Goran E., 4,344,952, Cl. 424-267.000.
Olympia Werke AG: *See*—
Ruh, Gerhard, 4,344,694, Cl. 355-3.0DD.
Olympus Optical Co., Ltd.: *See*—
Hattori, Shinichiro, 4,344,682, Cl. 354-62.000.
Kanayama, Katsumi; Furuta, Kenzi; and Motoyama, Kazuyasu, 4,345,286, Cl. 360-137.000.
Kimura, Kenji, 4,345,279, Cl. 360-36.000.
Kobayashi, Minoru, 4,345,287, Cl. 360-137.000.
Mizokami, Kazunori, 4,344,678, Cl. 354-23.00D.
Saito, Shoichi, 4,345,284, Cl. 360-132.000.
Tsukaya, Takashi, 4,344,684, Cl. 354-128.000.
Omori, Norio: *See*—
Matsumura, Toshimi; Omori, Norio; and Yamazoe, Hisamitsu, 4,344,399, Cl. 123-339.000.
Omura, Junichi: *See*—
Tanabe, Tetsuo; Takamori, Kazumi; Matueda, Akira; Matsui, Kiyoshi; Omura, Junichi; and Miyamoto, Hitoshi, 4,344,219, Cl. 29-564.600.
O'Neill, Charles E., to Inco Ltd. Reduction smelting process. 4,344,792, Cl. 75-9.000.
Ong, Helen H.; and Profitt, James A., to American Hoechst Corporation. Spiro[indoline-3,4'-piperidine]s. 4,345,081, Cl. 546-17.000.
Onishi, Masatoshi: *See*—
Kuroda, Akira; Nakamura, Tsutomu; and Onishi, Masatoshi, 4,345,042, Cl. 521-112.000.
Onozaki, Teruo, to Nippon Piston Ring Co., Ltd. Compression rings. 4,344,634, Cl. 277-236.000.
Oota, Masanori: *See*—
Yusa, Haruhiko; Oota, Masanori; and Isaka, Haruki, 4,345,043, Cl. 523-209.000.
Orita, Masatomo: *See*—
Tanaka, Junzo; and Orita, Masatomo, 4,345,134, Cl. 219-10.55B.
Orsinger, Winston A.; and Fallos, George, to Bell and Howell Company. Break-away device. 4,344,729, Cl. 414-226.000.
Osawa, Mitsuaki: *See*—
Matsumiya, Ritsuo; and Osawa, Mitsuaki, 4,344,380, Cl. 118-66.000.
Osborne, Robert L., to LaSalle Machine Tool, Inc. Self-lubricating machining apparatus. 4,344,507, Cl. 184-6.180.
Osegowitsch, Viktor: *See*—
Viehrig, Wolfgang; Osegowitsch, Viktor; and Hammer, Thomas, 4,344,690, Cl. 354-319.000.
Osmose Wood Preserving Co. of America, Inc.: *See*—
Fahlstrom, George B., 4,344,250, Cl. 47-57.500.
Ostertag, Werner; Bittler, Knut; and Bock, Gustav, to BASF Aktiengesellschaft. Preparation of flaky mica pigments coated with metal oxides, and use of these pigments. 4,344,987, Cl. 427-213.000.
Ostrowski, Arthur E.; and Polich, Joseph M., to Allied Tube & Conduit Corporation. Apparatus for continuously electrostatically coating an elongated object. 4,344,381, Cl. 118-626.000.
Ota, Naoto: *See*—
Kohzai, Yoshinori; Fujioka, Yoshiki; and Ota, Naoto, 4,345,192, Cl. 318-592.000.
Otis Engineering Corporation: *See*—
Arendt, Henry P., 4,344,602, Cl. 251-58.000.
Otto Tuchenhagen GmbH & Co. KG: *See*—
Tuchenhagen, Otto A. P.; Mieth, Hans O. E.; and Coura, Herbert R., 4,344,453, Cl. 137-240.000.
Outboard Marine Corporation: *See*—
Heismann, Richard A., 4,344,274, Cl. 56-202.000.
Ovshinsky, Herbert C.: *See*—
Klose, Peter H.; and Ovshinsky, Herbert C., 4,344,701, Cl. 355-51.000.
Owens-Corning Fiberglas Corporation: *See*—
Canfield, Sheldon A.; and Sanik, Paul S., 4,345,106, Cl. 373-27.000.
Henry, Richard K., 4,344,747, Cl. 425-140.000.
Rapp, Kenneth L.; and Zolnerovich, Walter, Jr., 4,344,582, Cl. 242-45.000.
Symborski, Alex P.; and Cunningham, Cecil R., 4,344,786, Cl. 65-2.000.
Owyang, King, to General Electric Company. Transistor having improved turn-off time and second breakdown characteristics with bi-level emitter structure. 4,345,266, Cl. 357-34.000.
Oxenreider, Terry; and Eberle, William J., to General Battery Corporation. Apparatus for deforming molded battery case. 4,344,748, Cl. 425-143.000.
Oy Partek AB: *See*—
Visa, Heikki; and Laitinen, Heikki, 4,344,731, Cl. 414-471.000.
P.I.V. Antrieb Werner Reimers GmbH & Co. KG: *See*—
Steuer, Herbert K., 4,344,761, Cl. 474-245.000.
Pace, W. David, to Motorola, Inc. Cascode current source. 4,345,217, Cl. 330-288.000.
Pachkowski, Michael M.; and Ross, Howard V. Process for separating oil from a naturally occurring mixture. 4,344,839, Cl. 208-11.00R.
Pagani, Giacomo, to JOBS S.p.A. Machine tool with portable tool receiving carriage. 4,344,221, Cl. 29-568.000.
Palmer, Bryan H.: *See*—
Copping, Leonard G.; Kerry, John C.; Watkins, Thomas I.; Willis, Robert J.; and Palmer, Bryan H., 4,344,893, Cl. 260-456.00A.
Pankau, Edward F., to Kendall Company, The. Device for collecting body fluids. 4,344,432, Cl. 128-275.000.
Panoch, Hans J.: *See*—
Mumcu, Salih; and Panoch, Hans J., 4,345,052, Cl. 525-411.000.
Pappas, John A.; and Hebert, Roger T., to GTE Products Corporation. High intensity reflector lamp. 4,345,178, Cl. 313-113.000.
Paquette, Edmund T.: *See*—
Latino, Richard M.; and Paquette, Edmund T., 4,344,205, Cl. 16-2.000.
Paquette, Rolland. Artists' medium. 4,344,997, Cl. 428-161.000.
Paradis, Joseph R.; and Kaleskas, Edward W., to Nypro Inc. Close fittings for frangible objects. 4,344,549, Cl. 222-465.00A.
Parker, Bernard; and Parsonnet, Brian, to Baker Instruments Corp. Automatic pipettor. 4,344,768, Cl. 23-230.00R.
Parker, Bernard: *See*—
Bamford, Charles R.; Mellor, James R.; and Parker, Bernard, 4,345,036, Cl. 501-37.000.
Parks, Albert R., to United States of America, Navy. Organotin antifouling coating with epoxy and polyacrylate compositions. 4,344,875, Cl. 424-78.000.
Parrish, David R., to Standard Oil Company (Indiana). Method for enhanced oil recovery. 4,344,486, Cl. 166-272.000.
Parsonnet, Brian: *See*—
Parker, Bernard; and Parsonnet, Brian, 4,344,768, Cl. 23-230.00R.
Parsons, James D.; and Yue, Alfred S., to University of California, The Regents of the. Light fibers made from components of a type II eutectic system. 4,345,177, Cl. 313-95.000.
Parsons, Robert, to Texas Instruments Incorporated. Apparatus for generating signals for producing a display of characters. 4,345,243, Cl. 340-728.000.
Paschen, Peter; Pfeiffer, Roland; Waldhecker, Heinz-Dieter; Kryczun, Alfred; and Pufal, Rolf, to Klockner-Humboldt-Deutz AG. Apparatus for the gasification of carbon and/or carbon-containing media. 4,344,773, Cl. 48-92.000.
Pascouet, Maurice Y. Method of making a cellular polymeric resin body in a self contained high-pressure mold form. 4,344,903, Cl. 264-55.000.
Paseman, Richard R. Apparatus for cleaning the interior of tubes. 4,344,570, Cl. 239-67.000.

Pauli, Karlheinz: *See—*
Pfeiler, Manfred; and Pauli, Karlheinz, 4,345,158, Cl. 378-5.000.
Paulus, Wilfried: *See—*
Kuhle, Engelbert; Paulus, Wilfried; Genth, Hermann; and Brandes, Wilhelm, 4,344,962, Cl. 424-300.000.
Pawlowski, Thomas D.: *See—*
Cherney, Jerome A.; and Pawlowski, Thomas D., 4,345,133, Cl. 219-10.55E.
Paxall, Inc.: *See—*
Eglinton, Robert B., 4,344,585, Cl. 242-66.000.
Payton, Raymus K.: *See—*
Lang, Paul W., 4,344,671, Cl. 350-174.000.
Lang, Paul W., 4,345,184, Cl. 313-475.000.
Pearson, Raymond H. Toilet seat and lid unit with concealed air deodorizer. 4,344,194, Cl. 4-213.000.
Peck, Albert W., to Alcan Research and Development Limited. Lift mechanism for a vehicle tail-board or other load platform. 4,344,508, Cl. 187-9.00R.
Peleckis, Anthony J.: *See—*
Chen, Evan N.; Emmett, James S.; Ferraro, Frank A.; and Peleckis, Anthony J., 4,344,227, Cl. 30-41.000.
Pellegrino, Giuseppe. Two-part moulded wheel made of plastic material for children's vehicle. 4,344,655, Cl. 301-2.500.
Peltzer & Ehlers GmbH & Co.: *See—*
Flamme, Walter; and Rahn, Oskar, 4,344,312, Cl. 72-452.000.
Penco, Sergio: *See—*
Suarato, Antonino; Penco, Sergio; and Arcamone, Federico, 4,345,070, Cl. 536-17.00A.
Suarato, Antonio; Penco, Sergio; and Arcamone, Federico, 4,345,068, Cl. 536-17.00A.
Penner, John. Adjustable wrench. 4,344,339, Cl. 81-157.000.
Penney, C. Bradford; Zabec, Glenn M.; and Sridharan, Sri P., to Streamlight, Inc. Rechargeable lamp assembly, mounting unit, and circuit therefor. 4,345,304, Cl. 362-183.000.
Penzien, Klaus: *See—*
Blinne, Gerd; Naarmann, Herbert; and Penzien, Klaus, 4,344,869, Cl. 252-517.000.
Blinne, Gerd; Naarmann, Herbert; and Penzien, Klaus, 4,344,870, Cl. 252-517.000.
Pere, Gerard, to Creusot-Loire. Apparatus for cooling and purification of exit gases from an electrolysis installation. 4,344,834, Cl. 204-278.000.
Perisastry, Ayyala; Vishe, Richard A.; and Hoet, Peter J., to Harsco Corporation. Projectile lock assembly. 4,344,528, Cl. 206-3.000.
Perkin-Elmer Corporation, The: *See—*
Gerlach, Robert L., 4,345,152, Cl. 250-396.0ML.
Shafer, David R., 4,344,676, Cl. 350-444.000.
Perrin, James. Log supporting rack for use in a fireplace. 4,344,412, Cl. 126-298.000.
Pesa, Frederick A.; and Haase, Thomas A., to Standard Oil Company. Carbonylation of olefinically unsaturated compounds. 4,344,866, Cl. 252-428.000.
Petaja, Glen E.; and Cedar, Charles E., to L & M Radiator, Inc. Heat exchange apparatus. 4,344,478, Cl. 165-69.000.
Petitcolas, Hubert, to Commissariat a l'Energie Atomique. Electric conducting cable insensitive to nuclear radiation. 4,345,111, Cl. 174-102.00A.
Petroff, Peter D. Flow analyzer. 4,344,329, Cl. 73-861.000.
Petty, Randall H.; and Bartley, Burton H., to Texaco Inc. Fluid catalytic cracking. 4,344,926, Cl. 423-244.000.
Peyser, Leonard F. Multi-purpose crampon. 4,344,238, Cl. 36-7.600.
Pfaff Industriemaschinen GmbH: *See—*
Tolle, Gunter, 4,344,375, Cl. 112-131.000.
Pfeifer, Wolf: *See—*
Kleemann, Axel; Lussling, Theodor; Pfeifer, Wolf; and Scherberich, Paul, 4,345,072, Cl. 542-442.000.
Pfeiffer, Roland: *See—*
Paschen, Peter; Pfeiffer, Roland; Waldhecker, Heinz-Dieter; Kryczun, Alfred; and Pufal, Rolf, 4,344,773, Cl. 48-92.000.
Pfeiffer Zerstaubervertriebsgesellschaft mbH & Co. KG: *See—*
Schuster, Wilhelm; and Stahl, Jurgen, 4,344,744, Cl. 417-550.000.
Pfeiler, Manfred; and Pauli, Karlheinz, to Siemens Aktiengesellschaft. Tomographic apparatus for the production of transverse layer images. 4,345,158, Cl. 378-5.000.
Pfleiderer, Ernst: *See—*
Monsheimer, Rolf; and Pfleiderer, Ernst, 4,344,762, Cl. 8-94.180.
Pfrotzschner, Hans: *See—*
Czech, Franz; Mauthe, Gerhard; and Pfrotzschner, Hans, 4,345,129, Cl. 200-163.000.
Philips, Peter, to Harman-Kardon, Incorporated. Indicator for headroom extension system for tape recorders. 4,345,281, Cl. 360-66.000.
Phillips Petroleum Company: *See—*
Bonazza, Benedict R.; and DeVault, Albert N., 4,344,771, Cl. 44-63.000.
Hawley, Gil R., 4,345,055, Cl. 526-96.000.
Johnson, Marvin M.; and Nowack, Gerhard P., 4,344,841, Cl. 208-211.000.
Rogers, David L., 4,345,105, Cl. 585-271.000.
Schorno, Karl S., 4,344,917, Cl. 422-78.000.
Sonnedecker, Ray L.; and Martin, Ronald P., 4,344,900, Cl. 261-114.0VT.
Phippen, Larry J.: *See—*
Casterton, Robert H.; Phippen, Larry J.; and Wright, Darrell L., 4,344,356, Cl. 98-2.110.
Photon Power, Inc.: *See—*
Chamberlin, Rhodes R., 4,344,817, Cl. 156-645.000.
Piccirillo, Thomas P.: *See—*
Dalamangas, Chris A.; and Piccirillo, Thomas P., 4,344,662, Cl. 339-59.00M.
Pichat, Philippe; and Sinn, Robert, to Societe Chimique des Charbonnages. Ozone whitening of synthetic gypsum. 4,344,925, Cl. 423-170.000.
Pickering & Company, Inc.: *See—*
Chass, Jacob, 4,345,230, Cl. 336-135.000.
Pielkenrood, Jacob, to Pielkenrood-Vinitex B.V. Method and a device for making flotable particles suspended in a liquid by means of gas bubbles. 4,344,845, Cl. 210-199.000.
Pielkenrood-Vinitex B.V.: *See—*
Pielkenrood, Jacob, 4,344,845, Cl. 210-199.000.
Pierburg Luftfahrtgerate Union GmbH: *See—*
Herrmann, Gert, 4,344,745, Cl. 418-132.000.
Piesold, David D. A. Decants of tailings dams. 4,344,720, Cl. 405-41.000.
Pilat, Howard L.; Moore, Jerry D.; and Chosnek, Jack, to Celanese Corporation. Ethylene recovery from ethyl acrylate process. 4,345,093, Cl. 560-205.000.
Pilgram, Kurt H.; and Skiles, Richard D., to Shell Oil Company. Certain herbicidal N-(para-(6-chloro-3-pyridazinyloxy)phenyl)trifluoromethanesulfonamides. 4,345,076, Cl. 544-241.000.
Pilgram, Kurt H., to Shell Oil Company. Certain herbicidal N-(meta-(6-chloro-3-pyridazinyloxy)phenyl)trifluoromethanesulfonamides. 4,345,077, Cl. 544-241.000.
Pilkington Brothers Limited: *See—*
Bamford, Charles R.; Mellor, James R.; and Parker, Bernard, 4,345,036, Cl. 501-37.000.
Fyles, Kenneth M.; and Shorrock, Peter, 4,345,037, Cl. 501-38.000.
Pillard, Jean-Claude, to Entreprise Generale de Chauffage Industriel Pillard. Gas generator with fixed bed and reverse draught, to gasify solid combustible materials. 4,344,772, Cl. 48-76.000.
Pines, Michael Y.; Whitney, Colin G.; and Duncan, James S., to Hughes Aircraft Company. Automatic responsivity control for a CCD imager. 4,345,148, Cl. 250-214.00C.
Pinsky, Michael L.; and Walden, John, to FMC Corporation. Recovery of alkali values from trona deposits. 4,344,650, Cl. 299-4.000.
Pioneer Ansafone Manufacturing Corporation: *See—*
Sato, Takashi; Tsuchiya, Tomio; and Matushima, Yasuo, 4,345,114, Cl. 179-6.160.
Pirelli Cable Corporation: *See—*
Silver, David A.; Dima, Attila F.; and Seman, George W., 4,345,109, Cl. 174-84.00R.
Pitetti, Raymond C.: *See—*
Bulger, Gary A.; Heck, Lyle D.; Huttemann, Robert D.; Morabito, Joseph M.; Pitetti, Raymond C.; Unger, Burton A.; and Vallere, Donald J., 4,344,223, Cl. 29-577.00C.
Pitts, James N., Jr.: *See—*
Shaffer, Steven D.; Kienitz, L. Michael; Pitts, James N., Jr.; and Bliss, Richard D., 4,344,712, Cl. 366-108.000.
Pivit, Erich: *See—*
Hasse, Peter; Wiesinger, Johannes; and Pivit, Erich, 4,345,293, Cl. 361-117.000.
Hasse, Peter; Wiesinger, Johannes; and Pivit, Erich, 4,345,295, Cl. 361-130.000.
Plapp, Gunther, to Robert Bosch GmbH. Device for air flow rate measurement in the air intake tube of an internal combustion engine. 4,344,322, Cl. 73-118.000.
Plueddemann, Edwin P., to Dow Corning Corporation. Stabilization of silicates using salts of substituted nitrogen or sulfur containing siliconates. 4,344,860, Cl. 252-389.00R.
Polaroid Corporation: *See—*
Borror, Alan L.; and Greenwald, Richard B., 4,345,018, Cl. 430-234.000.
Cournoyer, Richard L.; and Foley, James W., 4,345,017, Cl. 430-221.000.
Polich, Joseph M.: *See—*
Ostrowski, Arthur E.; and Polich, Joseph M., 4,344,381, Cl. 118-626.000.
Pollard, Lorne R., to International Harvester Co. Dual implement hitch. 4,344,639, Cl. 280-411.00C.
Polysar Limited: *See—*
Wunder, Richard H., 4,345,067, Cl. 528-485.000.
Possanza, Genus: *See—*
Cullen, Ernest; Possanza, Genus; and Stewart, Patrick B., 4,344,946, Cl. 424-250.000.
Potts, Roger F., to Convey Systems Div. of Export Tool & Welding Co. Ltd. Machine for cleaning receptacles. 4,344,448, Cl. 134-73.000.
PPG Industries, Inc.: *See—*
Henery, Vern A., 4,344,986, Cl. 427-180.000.
Jensen, Thomas H., 4,344,785, Cl. 65-1.000.
Krass, Dennis K., 4,344,789, Cl. 71-105.000.
Pray, Winston C., to Flexible Steel Lacing Company. Rivet guiding apparatus. 4,344,213, Cl. 29-243.500.
Prendergast, John J.: *See—*
Rizk, Sidky D.; Hsieh, Harry W. S.; and Prendergast, John J., 4,345,053, Cl. 525-440.000.
Procter & Gamble Company, The: *See—*
Allaway, Philip N.; Baginski, Richard M.; Liu, Don K. K.; and Teixeira, Theodore M., 4,344,871, Cl. 252-531.000.
Bolich, Raymond E., Jr., 4,345,080, Cl. 546-6.000.
Youngquist, Rudolph W.; and Brabbs, William J., 4,344,969, Cl. 426-18.000.

Profio, Mark V.: *See—*
Kampf, Julian C.; Graefe, Richard J.; and Profio, Mark V., 4,345,288, Cl. 361-31.000.

Profitt, James A.: *See—*
Ong, Helen H.; and Profitt, James A., 4,345,081, Cl. 546-17.000.

Projected Lubricants, Inc.: *See—*
Jamison, Warren E.; and McVeigh, James J., 4,344,278, Cl. 57-221.000.

Proulx, Oliver J.: *See—*
Milford, Alan H.; and Proulx, Oliver J., 4,344,902, Cl. 264-51.000.

Provder, Theodore; Holsworth, Richard M.; and Koehler, Mark E., to SCM Corporation. Method and apparatus for photogoniometric analysis of surfaces. 4,344,709, Cl. 356-445.000.

Pruitt, Malcolm E.: *See—*
Schmidt, Donald L.; Pruitt, Malcolm E.; and Dismuke, Keith I., 4,344,993, Cl. 428-35.000.

Pufal, Rolf: *See—*
Paschen, Peter; Pfeiffer, Roland; Waldhecker, Heinz-Dieter; Kryczun, Alfred; and Pufal, Rolf, 4,344,773, Cl. 48-92.000.

Puff, Roger M.; and Kita, Jean-Claude, to Charbonnages de France. Process and installation for treating coking coal. 4,344,769, Cl. 44-23.000.

Puryear, John W., to Brunswick Corporation. Drag spring for fishing reel. 4,344,586, Cl. 242-84.50A.

Pyke, Thomas R.: *See—*
Wovcha, Merle G.; Biggs, Candice B.; and Pyke, Thomas R., 4,345,033, Cl. 435-253.000.

Quaker Window Products Co.: *See—*
Knoll, Harold H., 4,344,255, Cl. 49-501.000.

Quarella, Guido, to Hauni-Werke Korber & Co. KG. Tobacco stream building channel for use in cigarette rod making machines or the like. 4,344,526, Cl. 198-689.000.

R. A. Jones & Co. Inc.: *See—*
Dieterlen, Paul E.; and Benner, Harold T., Jr., 4,344,269, Cl. 53-459.000.

Racilla, John J.; and Weber, Robert N., to AMP Incorporated. Connector for mass terminating individual conductors. 4,344,665, Cl. 339-99.00R.

Radke, John C., to Myo-Tronics Research, Inc. Mandibular electromyograph. 4,344,441, Cl. 128-733.000.

Radke, Leo L., to Western Electric Company, Inc. Methods and circuitry for varying a pulse output of a resonant circuit. 4,345,165, Cl. 307-265.000.

Rahn, Oskar: *See—*
Flamme, Walter; and Rahn, Oskar, 4,344,312, Cl. 72-452.000.

Raillard, Yves G.: *See—*
Dieudonne, Marc P. G.; and Raillard, Yves G., 4,345,326, Cl. 370-60.000.

Rainwater, Lawrence L., to Sperry Corporation. Steerable directional antenna. 4,345,256, Cl. 343-754.000.

Ramachandran, Sundaresan, to Union Carbide Corporation. Process for producing organo-silane coated asbestos base material. 4,344,992, Cl. 427-430.100.

Rampolla, Donald S., to United States of America, Energy. Method of increasing the deterrent to proliferation of nuclear fuels. 4,344,912, Cl. 376-180.000.

Ramsbotham, John; and van Gogh, Johan, to Shell Oil Company. Diglycidyl ethers of diphenylol alkanes, their preparation and use in curable compositions. 4,345,060, Cl. 528-103.000.

Rand, Burgess F.: *See—*
Hancock, Dane R.; and Rand, Burgess F., 4,344,319, Cl. 73-40.50R.

Rapp, Kenneth L.; and Zolnerovich, Walter, Jr., to Owens-Corning Fiberglas Corporation. Microprocessor-controlled product roving system. 4,344,582, Cl. 242-45.000.

Raschke, Bernward: *See—*
Lerche, Ernst; Raschke, Bernward; and Hartwig, Siegfried, 4,345,237, Cl. 340-27.00R.

Rasmussen, Chris R., to McNeilab, Inc. (1-Methyl-2-quinolinylidene) derivatives of guanidine. 4,345,083, Cl. 546-163.000.

Rathi, Ram N.; and Nelson, Ronald E., to Harnischfeger Corporation. Override control for axle locking apparatus of mobile crane. 4,344,497, Cl. 180-41.000.

Ratsko, Istvan; Ivony, Jozsef; Madi, Jeno; and Karasz, Gyorgy, to Autoipari Kutato Intezet; and Ikarus Karoszseria es Jarmugyar. Apparatus for the prevention of jackknifing of articulated vehicles. 4,344,640, Cl. 280-432.000.

Rauchschwalbe, Rudolf: *See—*
Naumann, Klaus; and Rauchschwalbe, Rudolf, 4,345,090, Cl. 560-124.000.

Rauma-Repola Oy: *See—*
Haapamaki, Pertti, 4,344,321, Cl. 73-61.400.

Ray, Earl B. Wheel suspension assembly for a trailer. 4,344,643, Cl. 280-724.000.

Raychem Corporation: *See—*
White, Lawrence J., 4,344,214, Cl. 29-252.000.

RCA Corporation: *See—*
Goodman, Alvin M.; and Tarng, Ming L., 4,344,985, Cl. 427-85.000.
Gries, Robert J.; Miko, Sandor; and Conn, Calvin E., 4,345,188, Cl. 315-411.000.
Harford, Jack R., 4,345,214, Cl. 330-254.000.
Salt, Walter W., Jr., 4,344,383, Cl. 118-730.000.
Schade, Otto H., Jr., 4,345,213, Cl. 330-253.000.
Schade, Otto H., Jr., 4,345,216, Cl. 330-288.000.
Waybright, George C., 4,345,275, Cl. 358-243.000.

Redemann, Richard, to Gewerkschaft Eisenhutte Westfalia. Crushing apparatus. 4,344,581, Cl. 241-88.400.

Reed, Norman L.: *See—*
Christian, Charlie R.; Gaskins, Jack C.; Hamrick, Jack; and Reed, Norman L., 4,344,211, Cl. 28-183.000.

Reich, Steven A., to Deere & Company. Multiple element thermal actuator. 4,345,234, Cl. 337-336.000.

Reimold, Dieter: *See—*
Haupt, Walter; Warncke, Heinz; Friebe, Heinz W.; and Reimold, Dieter, 4,344,320, Cl. 73-40.700.

Reinhard, Russell R.; Dorawala, Tansukhlal G.; and Kerr, Edwin R., to Texaco Inc. Steam regeneration of rhodium containing hydrocarbon dehydrocyclization catalysts. 4,344,865, Cl. 252-420.000.

Reinhardt, Friedrich; and Schmidt, Helmut, to Hoechst Aktiengesellschaft. Process for the preparation of transfer prints on optionally regenerated cellulose fibers and their mixtures with polyester fibers. 4,344,765, Cl. 8-471.000.

Reiser, Carl A.: *See—*
Fahle, Ronald W.; and Reiser, Carl A., 4,345,009, Cl. 429-37.000.

Reitberger, Peter H., to NCR Corporation. Method and apparatus for ink jet printing. 4,345,259, Cl. 346-75.000.

Reithmayr, Karl: *See—*
Siegl, Annemarie; Knopp, Christian; and Reithmayr, Karl, 4,344,933, Cl. 424-79.000.

Reliable Security Systems, Inc.: *See—*
Van Der Linden, Roy E., 4,344,647, Cl. 292-201.000.

Reliance Universal, Inc.: *See—*
Gray, Richard L., 4,344,991, Cl. 427-325.000.

Remington Arms Company, Inc.: *See—*
Bauman, Thomas G.; and Kast, Jack L., 4,344,246, Cl. 42-69.00B.

Remington, John L.; and Moyer, Robert W., to Stanley Works, The. Universal pallet. 4,344,368, Cl. 108-51.100.

Remus, Dieter: *See—*
Ganseuer, Horst; Remus, Dieter; and Gail, Heinz, 4,344,605, Cl. 266-48.000.

Renga, James M.: *See—*
Strege, Paul E.; and Renga, James M., 4,344,881, Cl. 549-229.000.

Renken, Michael J.; and Simmons, Billy P., to Trane Company, The. Average fluid flow sensor. 4,344,330, Cl. 73-861.660.

Renth, Larry: *See—*
Hoshall, Thomas C.; Hicks, LaVern L.; and Renth, Larry, 4,344,580, Cl. 241-60.000.

Resnick, Paul R., to Du Pont de Nemours, E. I., and Company. Process for alkyl perfluoro(4,7-dioxa-5-methyl-8-fluoroformylnonanoate. 4,345,092, Cl. 560-182.000.

Reszka, Leon. Animated Christmas display device. 4,344,243, Cl. 40-415.000.

Reynhout, Cornelis M.: *See—*
Haes, Freddy; Reynhout, Cornelis M.; Hermes, Guillaume M. P. G.; and Boiten, Ebbe, 4,344,228, Cl. 30-43.900.

Rheinhold & Mahla GmbH: *See—*
Haupt, Walter; Warncke, Heinz; Friebe, Heinz W.; and Reimold, Dieter, 4,344,320, Cl. 73-40.700.

Rhoades, George D.: *See—*
Tyree, Lewis, Jr.; Missig, James R.; and Rhoades, George D., 4,344,291, Cl. 62-62.000.

Rhone-Poulenc Industries: *See—*
Dupin, Thierry; Bouge, Gilbert; and Seigneurin, Laurent, 4,344,928, Cl. 423-626.000.

Ricard, Jacques: *See—*
Gerard, Roland; Brun, Norbert; and Ricard, Jacques, 4,345,303, Cl. 362-80.000.

Ricci, Andrew. Centrifuge cell collector apparatus. 4,344,562, Cl. 233-26.000.

Richardson, Clayton H., Jr.: *See—*
Watkins, Neil A.; and Richardson, Clayton H., Jr., 4,344,413, Cl. 126-429.000.

Richardson GmbH: *See—*
Wienecke, Horst, 4,344,972, Cl. 426-103.000.

Richardson, Harvey J.: *See—*
DeMoss, Dean; and Richardson, Harvey J., 4,345,285, Cl. 360-133.000.

Richardson, Ronald D., to Caterpillar Tractor Co. Dynamic timing adjustment tool. 4,344,323, Cl. 73-119.00A.

Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
Nagy, Geza T.; Szepesi, Gabor; and Gazdag, Maria, 4,344,950, Cl. 424-262.000.
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Dancsi, Lajos; Keve, Tibor; and Gazdac, Maria, 4,345,082, Cl. 546-51.000.

Ricoh Co. Ltd.: *See—*
Hara, Kazuyuki, 4,345,264, Cl. 346-154.000.
Kaneko, Tamaki; and Okuzawa, Tugio, 4,344,614, Cl. 271-288.000.
Satomi, Toyokazu, 4,344,695, Cl. 355-8.000.

Ridge, William A., to Cessna Aircraft Company, The. Signal bleed-down valve. 4,344,285, Cl. 60-452.000.

Ridley, Richard D., to Occidental Oil Shale, Inc. Determining the locus of a processing zone in an in situ oil shale retort through a well in the formation adjacent the retort. 4,344,484, Cl. 166-251.000.

Riebel, Hans-Jochem: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Hammann, Ingeborg; and Stendel, Wilhelm, 4,345,078, Cl. 544-244.000.

Riebs, Richard E., to RTE Corporation. Automatic sectionalizing system. 4,345,291, Cl. 361-68.000.
Rieck, Hilmar: *See—*
Kohler, Klaus; Woditsch, Peter; Rieck, Hilmar; and Rodi, Fritz, 4,344,799, Cl. 106-300.000.
Riggins, James D.: *See—*
Holoff, Manning; and Riggins, James D., 4,344,813, Cl. 156-527.000.
Riley, Richard E.; and Turner, Bradley D., to Spectrol Electronics Corporation. Variable resistance device having a resistance element with laser cuts. 4,345,235, Cl. 338-176.000.
Riner, Felix: *See—*
Bucher, Robert R.; and Riner, Felix, 4,344,307, Cl. 66-84.00R.
Ritcey, Gordon M.: *See—*
Lucas, Bernard H.; and Ritcey, Gordon M., 4,344,924, Cl. 423-54.000.
Rizk, Sidky D.; Hsieh, Harry W. S.; and Prendergast, John J., to Essex Chemical Corp. Silicon-terminated polyurethane polymer. 4,345,053, Cl. 525-440.000.
Robbins, Max L.; and Ernst, Edwin R., to Exxon Research & Engineering Co. Process for defoaming acid gas scrubbing solutions and defoaming solutions. 4,344,863, Cl. 252-192.000.
Robert Bosch GmbH: *See—*
Breitling, Wolfram, 4,345,296, Cl. 361-154.000.
Plapp, Gunther, 4,344,322, Cl. 73-118.000.
Schwerin, Gunter, 4,344,355, Cl. 91-445.000.
Seifert, Kurt, 4,344,575, Cl. 239-533.500.
Roberts, Karl H.: *See—*
MacRae, David M.; and Roberts, Karl H., 4,344,930, Cl. 424-28.000.
Roberts, Thomas E., Jr.: *See—*
Lill, Melvin H.; and Roberts, Thomas E., Jr., 4,344,234, Cl. 33-228.000.
Roberts, Webster C., to Molins Machine Company, Inc. Bonding machine and gravure applicator roll. 4,344,379, Cl. 118-44.000.
Robertson, William G., to Santa Barbara Medical Foundation Clinic. Ileostomy appliance and method for implanting the same. 4,344,434, Cl. 128-283.000.
Robot Foto & Electronic GmbH & Co. K.G.: *See—*
Milatz, Erhard; and Schmidt, Hans, 4,344,685, Cl. 354-173.000.
Rockwell International Corporation: *See—*
Cunningham, Vernon R., 4,345,222, Cl. 333-28.00R.
Longworth, Joe D., 4,345,211, Cl. 329-50.000.
Massie, Norbert A., 4,344,707, Cl. 356-354.000.
Nissim, Joseph, 4,344,622, Cl. 273-85.00G.
Sheldon, Leonard W., 4,344,653, Cl. 301-37.00T.
Yao, Shi-Kay, 4,344,675, Cl. 350-358.000.
Rockwool International A/S: *See—*
Jensen, Leif, 4,345,035, Cl. 501-29.000.
Rodi, Fritz: *See—*
Kohler, Klaus; Woditsch, Peter; Rieck, Hilmar; and Rodi, Fritz, 4,344,799, Cl. 106-300.000.
Rogers, David L., to Phillips Petroleum Company. Reducing methylacetylene charged to an ethylene production. 4,345,105, Cl. 585-271.000.
Rohaly, Janos: *See—*
Novak, Lajos; Szantay, Csaba; Rohaly, Janos; Kis-Tamas, Attila; Varjas, Laszlo; and Csutak, Janos, 4,344,959, Cl. 424-279.000.
Rohm GmbH: *See—*
Loechel, Hans-Peter; and Cooper, Tom, 4,345,006, Cl. 428-473.000.
Monsheimer, Rolf; and Pfleiderer, Ernst, 4,344,762, Cl. 8-94.180.
Rohner, Joachim; Zumfeld, Heinz; and Mauries, Reinhard, to W. Schlafhorst & Co. Method and apparatus for connecting an upper thread with a lower thread. 4,344,277, Cl. 57-22.000.
Rojey, Alexandre, to Institut Francais du Petrole. Process for heat production by means of a heat pump operated with a specific mixture of fluids as the working agent. 4,344,292, Cl. 62-114.000.
Rokutan, Hideaki: *See—*
Horiuchi, Michimasa; Ibamoto, Masahiko; and Rokutan, Hideaki, 4,345,190, Cl. 318-338.000.
Rolls-Royce Limited: *See—*
Smith, Stanley, 4,344,506, Cl. 184-6.110.
Williamson, Willie, 4,344,736, Cl. 415-14.000.
Romanauskas, William A., to Du Pont de Nemours, E. I., and Company. Centrifuge rotor having vertically offset trunnion pins. 4,344,563, Cl. 233-26.000.
Rosa, Jerry M., to United States of America, Energy. Retrievable fuel pin end member for a nuclear reactor. 4,344,914, Cl. 376-437.000.
Rosen, Perry: *See—*
Chan, Ka-Kong; Holland, George W.; and Rosen, Perry, 4,345,084, Cl. 548-237.000.
Rosenberg, Barnett: *See—*
Aaby, Trygve; and Rosenberg, Barnett, 4,344,440, Cl. 128-653.000.
Rosenberg, Harald, to Nordischer Maschinenbau Rud. Baader GmbH & Co. KG. Apparatus for aligning fish. 4,344,207, Cl. 17-63.000.
Ross, Howard V.: *See—*
Pachkowski, Michael M.; and Ross, Howard V., 4,344,839, Cl. 208-11.00R.
Ross, Ronald J.: *See—*
Sherman, John D.; and Ross, Ronald J., 4,344,851, Cl. 210-670.000.
Roussel Uclaf: *See—*
Martel, Jacques; Tessier, Jean; Teche. Andre; and Demoute, Jean-Pierre, 4,344,895, Cl. 260-465.00F.
Rowley, Paul R., to Atlantic Richfield Company. Sea life habitat. 4,344,384, Cl. 119-4.000.
RTE Corporation: *See—*
Riebs, Richard E., 4,345,291, Cl. 361-68.000.
Ruh, Gerhard, to Olympia Werke AG. Developing equipment for an electrophotographic copying device. 4,344,694, Cl. 355-3.0DD.
Ruhrkohle AG: *See—*
Mittelkotter, Alfred, 4,344,357, Cl. 98-50.000.
Rumpf, Robert J., to Firestone Tire & Rubber Company, The. Tandem dual spool retractor structure. 4,344,589, Cl. 242-107.40A.
Runion, Alton E.: *See—*
Mayer, William R.; and Runion, Alton E., 4,345,307, Cl. 362-306.000.
Russell, Charles R., deceased: *See—*
Shasha, Baruch S.; Doane, William M.; and Russell, Charles R., deceased, 4,344,857, Cl. 252-316.000.
Russell, Kathleen G., heir: *See—*
Shasha, Baruch S.; Doane, William M.; and Russell, Charles R., deceased, 4,344,857, Cl. 252-316.000.
Rutchik, Walter L.: *See—*
Jaeschke, James R.; and Rutchik, Walter L., 4,345,292, Cl. 361-94.000.
Ruter, Jorn, to Chemische Werke Huls AG. Transparent copolyamides and their application to transparent, impact resistant molded articles. 4,345,066, Cl. 528-324.000.
Ryan, Kenneth M.: *See—*
Liu, Thomas M. H.; Melillo, David G.; Ryan, Kenneth M.; Shinkai, Ichiro; and Sletzinger, Meyer, 4,344,885, Cl. 549-291.000.
Ryan, Richard B. Adjustable drapery support assembly. 4,344,210, Cl. 24-369.000.
Ryer, Jack: *See—*
Gutierrez, Antonio; Brois, Stanley J.; Ryer, Jack; and Deen, Harold E., 4,344,853, Cl. 252-33.600.
Ryobi Ltd.: *See—*
Ishii, Koji, 4,344,362, Cl. 101-425.000.
S and S Associates: *See—*
Schiller, Karl H., 4,344,240, Cl. 40-20.00R.
Sachot, Michel E., to Societe Hure S.A. Tool exchange apparatus for boring mills and method for exchanging tools. 4,344,220, Cl. 29-568.000.
St. Regis Paper Company: *See—*
Chaloupka, Premysl G., 4,344,727, Cl. 414-36.000.
Newton, Donald O.; and Wilharm, Fred B., 4,344,558, Cl. 229-62.500.
Saito, Atsunori: *See—*
Kojima, Yasuhumi; Saito, Atsunori; and Yoshimi, Akiro, 4,344,565, Cl. 236-46.00R.
Saito, Isao: *See—*
Machida, Yoshimasa; Saito, Isao; Nomoto, Seiichiro; Negi, Shigeto; Ikuta, Hironori; and Kitoh, Kyosuke, 4,344,944, Cl. 424-246.000.
Saito, Masato; Tsuchihashi, Michihiro; Takai, Yoshinori; Fukuyama, Keiji; and Watanabe, Keiji, to Mitsubishi Denki Kabushiki Kaisha. Metal vapor discharge lamp. 4,345,186, Cl. 315-49.000.
Saito, Shoichi, to Olympus Optical Co., Ltd. Device for preventing electrostatic charges on a magnetic recording tape of a tape cassette. 4,345,284, Cl. 360-132.000.
Sakai, Kouichi: *See—*
Akagi, Noriyuki; Ogawa, Yoshinari; and Sakai, Kouichi, 4,344,874, Cl. 524-296.000.
Sakakibara, Hideo; Fujiwara, Tatsuro; Okegawa, Osamu; Honda, Eiichi; Watanabe, Susumu; and Matsuda, Tetsuo, to Toyo Jozo Kabushiki Kaisha. Deformyltylosin derivatives. 4,345,069, Cl. 536-7.100.
Sakamoto, Jun: *See—*
Takeuchi, Sumio; Murooka, Rikichi; and Sakamoto, Jun, 4,345,241, Cl. 340-347.0CC.
Sakanoue, Kei: *See—*
Hirano, Shigeo; and Sakanoue, Kei, 4,345,024, Cl. 430-382.000.
Sakurai, Kazuhiro: *See—*
Idogaki, Takaharu; Kawai, Hisasi; Matsui, Takeshi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,345,228, Cl. 335-222.000.
Saleh, Mustafa Y. M., to Siemens Corporation. Zero crossing detector. 4,345,169, Cl. 307-354.000.
Sallmann, Alfred: *See—*
Habicht, Ernst; Ferrini, Pier G.; and Sallmann, Alfred, 4,344,957, Cl. 424-273.00B.
Salmonsen, Andrew R.; and Feehery, William J., Jr., to Campbell Soup Company. High-speed weighing and conveying apparatus. 4,344,493, Cl. 177-52.000.
Salt, Walter W., Jr., to RCA Corporation. Retainer ring for securing substrates in a vacuum deposition system. 4,344,383, Cl. 118-730.000.
Sam Garvin & Company: *See—*
Garvin, George R., 4,344,342, Cl. 83-45.000.
Sampson, George P., III, to Bell Telephone Laboratories, Incorporated. Clocked IGFET logic circuit. 4,345,170, Cl. 307-443.000.
Samuels, Alvin: *See—*
Fox, Irwin, 4,344,842, Cl. 208-244.000.
Samuels, David: *See—*
Fox, Irwin, 4,344,842, Cl. 208-244.000.
Sandberg, Harry W., to Du Pont de Nemours, E. I., and Company. Process and apparatus for packaging. 4,344,468, Cl. 141-69.000.
Sanderson, Barry D.: *See—*
Begeman, Robert H.; Sanderson, Barry D.; Weiss, Donald C.; and Zeph, David L., 4,345,251, Cl. 340-825.860.
Sandoz, Inc.: *See—*
Anderson, Paul L.; and Brittain, Darryl A., 4,344,966, Cl. 424-343.000.
Sanik, Paul S.: *See—*
Canfield, Sheldon A.; and Sanik, Paul S., 4,345,106, Cl. 373-27.000.

Sanns, Frank, Jr., to Mobay Chemical Corporation. Self-granulating reaction product of 4,4'-diphenylmethane diisocyanate and resorcinol. 4,344,892, Cl. 260-453.0AM.
Sano, Shigenori, to Casio Computer Co., Ltd. Automatic rhythm accompaniment system. 4,344,345, Cl. 84-1.030.
Santa Barbara Medical Foundation Clinic: *See*—
Robertson, William G., 4,344,434, Cl. 128-283.000.
Santa Barbara Research Center: *See*—
Sutcliffe, Edward Y.; and Cole, Roger A., 4,344,476, Cl. 164-76.100.
Santiago, Andres; and Santiago, Enrique, to Zeuna-Staerker KG. Catalyzer for detoxifying exhaust gases from internal combustion engines. 4,344,921, Cl. 422-179.000.
Santiago, Andres; and Santiago, Enrique, to Zeuna-Staerker KG. Catalyzer for detoxifying exhaust gases from internal combustion. 4,344,922, Cl. 422-179.000.
Santiago, Enrique: *See*—
Santiago, Andres; and Santiago, Enrique, 4,344,921, Cl. 422-179.000.
Santiago, Andres; and Santiago, Enrique, 4,344,922, Cl. 422-179.000.
Sapi, Janos: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Dancsi, Lajos; Keve, Tibor; and Gazdac, Maria, 4,345,082, Cl. 546-51.000.
Sarnecki, Wilhelm: *See*—
Steck, Werner; Sarnecki, Wilhelm; Marosi, Laszlo; Ohlinger, Manfred; and Loeser, Werner, 4,344,791, Cl. 75-0.5AA.
Sartorius GmbH: *See*—
Knothe, Erich; Berg, Christoph; and Melcher, Franz-Josef, 4,344,494, Cl. 177-210.00R.
Sato, Hiroko: *See*—
Sugiyama, Katsumi; Takeda, Hideo; and Sato, Hiroko, 4,345,091, Cl. 560-163.000.
Sato, Isao: *See*—
Minakawa, Yoshimitsu; Ishibashi, Yoji; Sato, Isao; Uchiyama, Yoshihiro; and Takahashi, Kazuyoshi, 4,344,280, Cl. 60-39009.00F.
Sato, Matsuo. Water feed valve with sprinkling holes. 4,344,452, Cl. 137-238.000.
Sato, Takashi; Tsuchiya, Tomio; and Matushima, Yasuo, to Pioneer Ansafone Manufacturing Corporation. Method and apparatus for recording and reproducing a message with an indication of a time occurrence. 4,345,114, Cl. 179-6.160.
Satoh, Yoji: *See*—
Takada, Shigetaka; and Satoh, Yoji, 4,344,898, Cl. 261-39.00E.
Satomi, Toyokazu, to Ricoh Company, Ltd. Method and apparatus for slitwise exposure of photosensitive member in copying machines. 4,344,695, Cl. 355-8.000.
Saunders, Robert L.: *See*—
Farr, Aaron V.; and Saunders, Robert L., 4,344,200, Cl. 14-71.500.
Sawada, Hiroji; Igawa, Tatsuo; and Nagae, Hiromitsu, to Nissan Motor Company, Limited; and Hitachi, Ltd. Distributor. 4,345,120, Cl. 200-19.00R.
Sawano, Hiroshi: *See*—
Yagi, Michio; and Sawano, Hiroshi, 4,344,679, Cl. 354-25.000.
Sawyer, Willard H.: *See*—
Cull, Neville L.; and Sawyer, Willard H., 4,344,867, Cl. 252-439.000.
Scapa Dryers, Inc.: *See*—
Harwood, William J., 4,344,209, Cl. 24-31.00R.
Schade, Otto H., Jr., to RCA Corporation. Differential-input amplifier circuitry with increased common-mode voltage range. 4,345,213, Cl. 330-253.000.
Schade, Otto H., Jr., to RCA Corporation. Compensation of base-current-related error in current mirror amplifier circuitry. 4,345,216, Cl. 330-288.000.
Schafer, Walter; Wagner, Kuno; and Block, Hans-Dieter, to Bayer Aktiengesellschaft. Process for the production of polyisocyanates which contain carbodiimide groups and which are stable in storage. 4,344,855, Cl. 252-182.000.
Scharrenbroich, Helmut: *See*—
Fritz, Hans-Gerhard; and Scharrenbroich, Helmut, 4,344,749, Cl. 425-174.400.
Scheingold, William S.: *See*—
Corman, Ned E.; Kandybowski, Steven J.; Scheingold, William S.; and Youngfleish, Frank C., 4,345,267, Cl. 357-81.000.
Schep, Raymond A., to Occidental Research Corporation. Process for producing benzene carboxylic acid salts and their acids. 4,345,098, Cl. 562-482.000.
Scherberich, Paul: *See*—
Kleemann, Axel; Lussling, Theodor; Pfeifer, Wolf; and Scherberich, Paul, 4,345,072, Cl. 542-442.000.
Schering AG: *See*—
Boroschewski, Gerhard; Nusslein, Ludwig; and Arndt, Friedrich, 4,344,790, Cl. 71-111.000.
Schering Aktiengesellschaft (A.G.): *See*—
Wiechert, Rudolf; Bittler, Dieter; Schleusener, Annerose; and Albring, Manfred, 4,344,941, Cl. 424-243.000.
Schiller, Karl H., to S and S Associates. Identification snap. 4,344,240, Cl. 40-20.00R.
Schindler, Walter: *See*—
Heller, Rudolf; and Schindler, Walter, 4,344,595, Cl. 248-542.000.
Schleusener, Annerose: *See*—
Wiechert, Rudolf; Bittler, Dieter; Schleusener, Annerose; and Albring, Manfred, 4,344,941, Cl. 424-243.000.
Schlueter, Francis E.; and Kent, Brian E., to Deere & Company. Head assembly for a cotton harvester. 4,344,271, Cl. 56-13.600.
Schmidhuber, Erich: *See*—
Dathe, Joachim; and Schmidhuber, Erich, 4,345,108, Cl. 174-52.00H.
Schmidt, Donald L.; Pruitt, Malcolm E.; and Dismuke, Keith I., to Dow Chemical Company, The. Perfluorocarbon-polymeric coatings having low critical surface tensions. 4,344,993, Cl. 428-35.000.
Schmidt, Hans: *See*—
Milatz, Erhard; and Schmidt, Hans, 4,344,685, Cl. 354-173.000.
Schmidt, Helmut: *See*—
Reinhardt, Friedrich; and Schmidt, Helmut, 4,344,765, Cl. 8-471.000.
Schmits, Heinz-Herbert: *See*—
Heinemann, Otto; and Schmits, Heinz-Herbert, 4,344,783, Cl. 55-459.00B.
Schmittbetz, Klaus; and Struchtrup, Karl D. S., to International Harvester Co. Change-speed transmission with speed-range selection means for motor vehicles, particularly for farm tractors. 4,344,334, Cl. 74-473.00R.
Schneider, Hartmut; and Grabmaier, Josef, to Siemens Aktiengesellschaft. Envelope for metal halide discharge lamp with protective layer containing B_2O_3. 4,345,180, Cl. 313-221.000.
Schneider, Louis; Graham, David E., deceased; and Fidelity Union Trust Company, Executor, to GAF Corporation. Method of plant growth regulation. 4,344,788, Cl. 71-76.000.
Schorno, Karl S., to Phillips Petroleum Company. Sample inlet for analysis instrument and method of sample analysis. 4,344,917, Cl. 422-78.000.
Schrock, Wilfried: *See*—
Niemers, Ekkehard; Konig, Hans-Bodo; Schrock, Wilfried; and Metzger, Karl G., 4,344,939, Cl. 424-226.000.
Niemers, Ekkehard; Konig, Hans-Bodo; Schrock, Wilfried; and Metzger, Karl G., 4,344,955, Cl. 424-271.000.
Schroder, Rolf: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Hammann, Ingeborg; and Stendel, Wilhelm, 4,345,078, Cl. 544-244.000.
Schroeder, George F.: *See*—
Ljung, Bo H. G.; and Schroeder, George F., 4,344,706, Cl. 356-350.000.
Schroeder, Roger A., to American Can Company. Apparatus for winding webs. 4,344,584, Cl. 242-56.00A.
Schubert, Klaus: *See*—
Lahrs, Jurgen; Schubert, Klaus; Gosling, Claus; Jovcic, Dorde; Gleinig, Harald; and Skerhut, Reiner, 4,344,766, Cl. 8-524.000.
Schultz, Jerome S., to United States of America, Health, Education and Welfare. Optical sensor of plasma constituents. 4,344,438, Cl. 128-634.000.
Schuricht, Henry A., to Amsted Industries Incorporated. Load bearing oscillator drive. 4,344,332, Cl. 74-54.000.
Schuster, Robert W.; and Mittendorf, Gerald C., to Bendix Corporation, The. Manually operated metering valve for a fuel control. 4,344,281, Cl. 60-39.28R.
Schuster, Wilhelm; and Stahl, Jurgen, to Pfeiffer Zerstaubervertriebsgesellschaft mbH & Co. KG. Spray pump. 4,344,744, Cl. 417-550.000.
Schutt, Bernd: *See*—
Budecker, Ludwig; and Schutt, Bernd, 4,344,451, Cl. 137-101.000.
Schwab, Andre: *See*—
Cazarra, Victor; Schwab, Andre; and Zunino, Patrick, 4,344,815, Cl. 156-601.000.
Schwartz, S. Robert; Swan, William E., Jr.; Fetterman, Robert C.; and Neubaum, Victor A., deceased (by Neubaum, Doris W., administratrix), to Bethlehem Steel Corporation. One-spot car coke quenching method. 4,344,822, Cl. 201-39.000.
Schwarz, Gerd-Ulrich; Kiehs, Karl; and Adolphi, Heinrich, to BASF Aktiengesellschaft. Insecticidal benzylfurylmethyl esters of 3-(2,2-dichlorovinyl)-2,2-dimethyl-cyclopropane carboxylic acids. 4,344,961, Cl. 424-285.000.
Schwendemann, Volker: *See*—
Koenig, Karl-Heinz; Schwendemann, Volker; and Feuerherd, Karl-Heinz, 4,344,891, Cl. 260-453.00A.
Schwerin, Gunter, to Robert Bosch GmbH. Control arrangement for a hydraulically operated implement. 4,344,355, Cl. 91-445.000.
SCM Corporation: *See*—
Provder, Theodore; Holsworth, Richard M.; and Koehler, Mark E., 4,344,709, Cl. 356-445.000.
Scuccato, Serge L.: *See*—
Eastcott, Peter deH.; Truman, Peter T.; and Scuccato, Serge L., 4,345,123, Cl. 200-52.00R.
Seagrove, Douglas J. W.: *See*—
Czoch, Jerzy W.; and Seagrove, Douglas J. W., 4,344,520, Cl. 198-347.000.
Sedlacek, Hans-Herald; and Seiler, Friedrich R., to Behringwerke Aktiengesellschaft. Agent for the treatment of allergic reactions. 4,344,938, Cl. 424-177.000.
Seidel, Heinz H., to GTE Products Corporation. Cutting insert. 4,344,725, Cl. 407-114.000.
Seifert, Hermann: *See*—
Goedecke, Ralf; Hofen, Willi; Seifert, Hermann; and Siekmann, Gerd, 4,344,897, Cl. 260-502.00R.
Seifert, Kurt, to Robert Bosch GmbH. Fuel injection nozzle for internal combustion engines. 4,344,575, Cl. 239-533.500.
Seigneurin, Laurent: *See*—
Dupin, Thierry; Bouge, Gilbert; and Seigneurin, Laurent, 4,344,928, Cl. 423-626.000.

Seikenkai: *See*—
Hata, Kosei, 4,345,032, Cl. 435-253.000.
Seiler, Friedrich R.: *See*—
Sedlacek, Hans-Herald; and Seiler, Friedrich R., 4,344,938, Cl. 424-177.000.
Seiler, Werner, to Gebruder Buhler AG. Process for the production of agglomerated bread crumbs. 4,344,975, Cl. 426-285.000.
Sekiguchi, Takeshi, to Canon Kabushiki Kaisha. Television camera. 4,345,271, Cl. 358-55.000.
Seman, George W.: *See*—
Silver, David A.; Dima, Attila F.; and Seman, George W., 4,345,109, Cl. 174-84.00R.
Semon, Georges; and Wavre, Alain, to Ateliers des Charmilles, S.A. Method and apparatus for electrode tool wear compensation. 4,345,131, Cl. 219-69.00G.
Seppala, Lynn G.; and Haas, Roger A., to United States of America, Energy. Efficient optical pulse stacker system. 4,345,212, Cl. 330-4.300.
Seragnoli, Enzo, to G. D Societa per Azioni. Apparatus for directly linking one or more cigarette making machines to one or more cigarette packing machines. 4,344,445, Cl. 131-282.000.
Servo Corporation of America: *See*—
Bambara, Joseph E., 4,345,274, Cl. 358-108.000.
Shackle, Peter W.: *See*—
Davis, James A.; MacPherson, William F.; Mussman, Harry E.; and Shackle, Peter W., 4,345,163, Cl. 307-252.00A.
Shafer, David R., to Perkin-Elmer Corporation, The. Single element spherical surfaced optics insensitive to wavelength and temperature. 4,344,676, Cl. 350-444.000.
Shafer, Gale E., Jr. Mold for embedding one article with another. 4,344,600, Cl. 249-88.000.
Shaffer, Steven D.; Kienitz, L. Michael; Pitts, James N., Jr.; and Bliss, Richard D., to University of California, The Regents of the. Culture processing apparatus and method. 4,344,712, Cl. 366-108.000.
Shames, Harold: *See*—
Shames, Sidney J.; and Shames, Harold, 4,344,578, Cl. 239-583.000.
Shames, Sidney J.; and Shames, Harold. Handled spray. 4,344,578, Cl. 239-583.000.
Sharpe, Frederick R.; Grimmett, Christopher M.; and Laws, Derek R. J., to Brewing Research Foundation, The. Preparation of hop extracts rich in particular constituents. 4,344,978, Cl. 426-600.000.
Sharps, G. Vincent, Jr.: *See*—
Johnson, D. Emil; Krutchen, Charles M.; and Sharps, G. Vincent, Jr., 4,344,710, Cl. 366-76.000.
Shasha, Baruch S.; Doane, William M.; and Russell, Charles R., deceased (by Russell, Kathleen G., heir), to United States of America, Agriculture. Encapsulation by entrapment. 4,344,857, Cl. 252-316.000.
Sheldon, Leonard W., to Rockwell International Corporation. Wheel trim device. 4,344,653, Cl. 301-37.00T.
Shell Oil Company: *See*—
Pilgram, Kurt H.; and Skiles, Richard D., 4,345,076, Cl. 544-241.000.
Pilgram, Kurt H., 4,345,077, Cl. 544-241.000.
Ramsbotham, John; and van Gogh, Johan, 4,345,060, Cl. 528-103.000.
Shelley, Donald L., to Armstrong World Industries, Inc. Bridgeless dielectric measurement. 4,345,204, Cl. 324-61.00R.
Shelley, Edwin F. Automatic telephone message interception system. 4,345,113, Cl. 179-2.00A.
Shelley, Stanley J.; and Emblem, Harold G., to Clinotherm Limited. Method for reducing the thermal inertia of a furnace or oven wall and insulated wall produced thereby. 4,344,753, Cl. 432-3.000.
Shelton, Joe. Edge effect elimination and beam forming designs for field emitting arrays. 4,345,181, Cl. 313-309.000.
Sherman, John D.; and Ross, Ronald J., to Union Carbide Corporation. Phillipsite-type zeolites for ammonia adsorption. 4,344,851, Cl. 210-670.000.
Sherman, Stanley. Oral endotracheal tube protector, and methods of constructing and utilizing same. 4,344,428, Cl. 128-207.140.
Sherritt Gordon Mines Limited: *See*—
Meddings, Basil; and Kaiser, Heinz, 4,344,574, Cl. 239-338.000.
Shiba, Masami: *See*—
Fujihara, Youji; Shiba, Masami; Hazama, Toshio; and Kito, Shozo, 4,344,514, Cl. 192-3.580.
Shibata, Kazuhiko: *See*—
Amano, Hiroyuki; Yoshida, Tsuyoshi; and Shibata, Kazuhiko, 4,345,240, Cl. 340-345.000.
Shibata, Takuo: *See*—
Ogawa, Kazufumi; Chikamura, Takao; and Shibata, Takuo, 4,345,021, Cl. 430-321.000.
Shibuya, Tsuneo: *See*—
Fujita, Kenji; Korehisa, Kazuo; Asaba, Hirosi; Harada, Hideo; and Shibuya, Tsuneo, 4,344,204, Cl. 15-93.00A.
Shim, Norman: *See*—
Gupton, John E.; and Shim, Norman, 4,344,429, Cl. 128-214.00R.
Shima, Yoshihiro: *See*—
Yasuye, Toshikazu; Kashioka, Seiji; and Shima, Yoshihiro, 4,345,312, Cl. 364-515.000.
Shimada, Shoji; Sonoda, Sakae; and Yokoyama, Kimio, to Nihon Parkerizing Co., Ltd. Method for cold rolling and cleaning steel plates. 4,344,308, Cl. 72-39.000.
Shimano Industrial Company Limited: *See*—
Shimano, Keizo, 4,344,659, Cl. 308-187.100.
Shimano, Keizo, to Shimano Industrial Company Limited. Sealing construction for a rotating portion at a bicycle. 4,344,659, Cl. 308-187.100.
Shin-Etsu Chemical Co., Ltd.: *See*—
Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, 4,344,981, Cl. 427-40.000.
Ogiwara, Kesami, 4,344,260, Cl. 51-283.00E.
Shinkai, Ichiro: *See*—
Liu, Thomas M. H.; Melillo, David G.; Ryan, Kenneth M.; Shinkai, Ichiro; and Sletzinger, Meyer, 4,344,885, Cl. 549-291.000.
Shinya, Yasuo: *See*—
Yamada, Koichi; and Shinya, Yasuo, 4,344,904, Cl. 264-66.000.
Shirato, Yoshiaki; Takatori, Yasushi; Hara, Toshitami; Nishimura, Yukuo; and Takahashi, Michiko, to Canon Kabushiki Kaisha. Ink jet recording method. 4,345,262, Cl. 346-140.00R.
Shirota, Norihisa, to Sony Corporation. Video signal processing apparatus. 4,345,272, Cl. 358-21.00R.
Shizuka, Kohei: *See*—
Asano, Shiro; Shizuka, Kohei; Kambara, Yoshihiko; Mikami, Junji; Kato, Hiroshi; and Honda, Tadatoshi, 4,345,101, Cl. 564-206.000.
Shore, Ronald H. Means for separating light reflective fabrics. 4,344,473, Cl. 160-121.00R.
Shorrock, Peter: *See*—
Fyles, Kenneth M.; and Shorrock, Peter, 4,345,037, Cl. 501-38.000.
Showalter, Merle R., to Automotive Engine Associates. High swirl very low pollution piston engine employing optimizable vorticity. 4,344,394, Cl. 123-306.000.
Shukla, Jayendra G.: *See*—
Smith, Ray E.; Shukla, Jayendra G.; and Nicholson, Richard R., 4,345,002, Cl. 428-288.000.
Shumaker, John F., to J. I. Case Company. Self-leveling bucket linkage. 4,344,734, Cl. 414-710.000.
Sidwell, Albert E.: *See*—
Howard, Kenneth J.; and Sidwell, Albert E., 4,345,097, Cl. 562-472.000.
Siebenhofer, Gottfried: *See*—
Suessenbeck, Heinrich; Siebenhofer, Gottfried; Neuper, Rienhard; and Zitz, Alfred, 4,344,354, Cl. 91-168.000.
Siegl, Annemarie; Knopp, Christian; and Reithmayr, Karl, to Chemie Linz Aktiengesellschaft. Pharmaceutical composition with prolonged broncholytic and tocolytic activity. 4,344,933, Cl. 424-79.000.
Siekmann, Gerd: *See*—
Goedecke, Ralf; Hofen, Willi; Seifert, Hermann; and Siekmann, Gerd, 4,344,897, Cl. 260-502.00R.
Siemag Transplan GmbH: *See*—
Ganseuer, Horst; Remus, Dieter; and Gail, Heinz, 4,344,605, Cl. 266-48.000.
Siemens Aktiengesellschaft: *See*—
Barabas, Udo; Moehrmann, Karl-Heinz; and Christiansen, Hans-Marlin, 4,345,273, Cl. 358-86.000.
Brunner, Anton, 4,345,257, Cl. 343-780.000.
Dathe, Joachim; and Schmidhuber, Erich, 4,345,108, Cl. 174-52.00H.
Dietze, Wolfgang, 4,345,142, Cl. 219-390.000.
Gies, Johannes, 4,345,164, Cl. 307-255.000.
Pfeiler, Manfred; and Pauli, Karlheinz, 4,345,158, Cl. 378-5.000.
Schneider, Hartmut; and Grabmaier, Josef, 4,345,180, Cl. 313-221.000.
Siemens Corporation: *See*—
Saleh, Mustafa Y. M., 4,345,169, Cl. 307-354.000.
Sigal, Jacob, to FMC Corporation. Beam joining apparatus. 4,344,716, Cl. 403-13.000.
Signode Corporation: *See*—
Wolfberg, Robert, 4,344,555, Cl. 227-130.000.
Silagy, Richard J.: *See*—
Norton, James F.; Silagy, Richard J.; and Antoniw, Walter W., 4,344,455, Cl. 137-329.400.
Sillars, Frederick S.: *See*—
Bouzianis, George J.; Hollick, John G.; McIlvin, Donald B.; and Sillars, Frederick S., 4,344,199, Cl. 12-54.300.
Silver, David A.; Dima, Attila F.; and Seman, George W., to Pirelli Cable Corporation. Restraint apparatus for pipe type electric cables. 4,345,109, Cl. 174-84.00R.
Simmons, Billy P.: *See*—
Renken, Michael J.; and Simmons, Billy P., 4,344,330, Cl. 73-861.660.
Sindelar, Ernest C., to Caterpillar Tractor Co. Volume compensation for hydraulic circuits. 4,344,287, Cl. 60-572.000.
Singer Company, The: *See*—
Ljung, Bo H. G.; and Schroeder, George F., 4,344,706, Cl. 356-350.000.
Stein, Morris O., 4,345,318, Cl. 365-196.000.
Tsai, Robert C.; and Kidwell, William J., 4,345,258, Cl. 346-17.000.
Sinn, Robert: *See*—
Pichat, Philippe; and Sinn, Robert, 4,344,925, Cl. 423-170.000.
Siposs, George G. Directed flow bubble trap for arterial blood. 4,344,777, Cl. 55-178.000.
Sirtl, Wolfgang, to Kaffee-Veredelungs-Werk Koffeinfrei Kaffee GmbH & Co. Process for decaffeinizing raw coffee. 4,344,974, Cl. 426-271.000.
Skalka, Robert J., to Motorola Inc. Frequency and frequency error counting in test apparatus. 4,345,206, Cl. 324-79.00R.
Skerhut, Reiner: *See*—
Lahrs, Jurgen; Schubert, Klaus; Gosling, Claus; Jovcic, Dorde; Gleinig, Harald; and Skerhut, Reiner, 4,344,766, Cl. 8-524.000.

SKF Industrial Trading & Development Company, B.V.: *See*—
Vermeiren, Karel N.; Heemskerk, Rutgerus S.; and Dolfsma, Hendrik, 4,345,203, Cl. 324-61.00R.
Skiles, Richard D.: *See*—
Pilgram, Kurt H.; and Skiles, Richard D., 4,345,076, Cl. 544-241.000.
Skipper, Uvon. Degasser. 4,344,774, Cl. 55-41.000.
Skomal, Edward N., to United States of America, Air Force. Reentry vehicle radar cross section signature modification. 4,345,254, Cl. 343-18.00B.
Sletzinger, Meyer: *See*—
Liu, Thomas M. H.; Melillo, David G.; Ryan, Kenneth M.; Shinkai, Ichiro; and Sletzinger, Meyer, 4,344,885, Cl. 549-291.000.
Sloyan, Jerome J., to File, Joseph; and Hubbard, Seth A. Motor support. 4,344,598, Cl. 248-651.000.
Slurry Mining Engineering Inc.: *See*—
Nolan, James J.; and Coakley, John E., 4,344,491, Cl. 175-317.000.
Smith, Allan L. Trickle flow irrigation valve. 4,344,576, Cl. 239-542.000.
Smith, Dale A., to McDonnell Douglas Corporation. Flexible corner seal structure for cryogenic container. 4,344,264, Cl. 52-247.000.
Smith, Francis C., to Smith's Ostomy Products, Inc. Ostomates appliance. 4,344,433, Cl. 128-283.000.
Smith International, Inc.: *See*—
Oelke, Erwin S., 4,344,629, Cl. 277-1.000.
Smith, J. T. Waterwheel power generator. 4,345,160, Cl. 290-52.000.
Smith, Marvin O., Jr., to Bethlehem Steel Corporation. Blast furnace support apparatus. 4,344,607, Cl. 266-198.000.
Smith, Paul; and Lemstra, Pieter J., to Stamicarbon, B.V. Process for making polymer filaments which have a high tensile strength and a high modulus. 4,344,908, Cl. 264-203.000.
Smith, Paul H.: *See*—
Bergeron, David L.; and Smith, Paul H., 4,344,222, Cl. 29-571.000.
Smith, Ray E.; Shukla, Jayendra G.; and Nicholson, Richard R., to Great Lakes Chemical Corporation. Novel intumescent composition and flame retardant articles treated therewith. 4,345,002, Cl. 428-288.000.
Smith, Ronald: *See*—
Bancroft, John; Greenhalgh, John L.; and Smith, Ronald, 4,344,525, Cl. 198-499.000.
Smith, Stanley, to Rolls-Royce Limited. Arrangements for drainage of lubricating oil from bearing assemblies. 4,344,506, Cl. 184-6.110.
Smith, Verity C., to Vaponics, Inc. Distillation system and process. 4,344,826, Cl. 203-2.000.
Smith, W. Christen; McGill, Terry J.; and Spangler, Herbert L., to Industrial Air, Inc. Apparatus for discharging exhaust gas at high velocity. 4,344,370, Cl. 110-162.000.
Smith's Ostomy Products, Inc.: *See*—
Smith, Francis C., 4,344,433, Cl. 128-283.000.
Smitt, Asbjorn, to Christian Rovsing A/S. Process and system for error detection in a computer-controlled telephone exchange. 4,345,324, Cl. 370-14.000.
Sobodowski, Joseph J., IV: *See*—
Story, James R.; and Sobodowski, Joseph J., IV, 4,345,146, Cl. 235-381.000.
Societe Anonyme Automobiles Citroen: *See*—
Etienne, Michel, 4,344,513, Cl. 192-.02R.
S.A. VAL-REX: *See*—
Tourre, Raymond, 4,344,241, Cl. 40-124.200.
Societe Chimique des Charbonnages: *See*—
Pichat, Philippe; and Sinn, Robert, 4,344,925, Cl. 423-170.000.
Societe d'Etudes de Produits Chimiques: *See*—
Huve, Pierre M., 4,344,947, Cl. 424-251.000.
Societe Francaise d'Equipements pour la Navigation Aerienne: *See*—
Gautier, Bernard, 4,345,310, Cl. 364-429.000.
Thuy, Pham D., 4,345,327, Cl. 371-9.000.
Societe Hure S.A.: *See*—
Sachot, Michel E., 4,344,220, Cl. 29-568.000.
Societe Micro-Mega S.A.: *See*—
Leonard, Henri, 4,344,746, Cl. 418-270.000.
Societe Nationale des Poudres et Explosifs: *See*—
Grange, Andre A.; and Corbe, Jean A., 4,344,983, Cl. 427-46.000.
Societe Suisse pour l'Industrie Horlogere Management Services S.A.: *See*—
Zumsteg, Alphonse, 4,345,221, Cl. 331-176.000.
Soddy, Thomas C.: *See*—
Fritz, William E.; and Soddy, Thomas C., 4,344,365, Cl. 105-282.00A.
Soleau, Bertrand S., Jr. Recirculating natural convection solar still. 4,344,824, Cl. 202-234.000.
Solvay & Cie.: *See*—
Coppens, Guillaume, 4,345,031, Cl. 435-137.000.
Somogyi, Paul S. Domestic inventory system. 4,344,644, Cl. 283-19.000.
Sonics Research Corporation: *See*—
Colomb, Denis G., 4,345,276, Cl. 358-258.000.
Sonnedecker, Ray L.; and Martin, Ronald P., to Phillips Petroleum Company. Fractionator tray valve. 4,344,900, Cl. 261-114.0VT.
Sono, Kenzo; and Kuramoto, Shiyunji, to Nippon Sheet Glass Co., Ltd. Method for forming patterned coating. 4,344,988, Cl. 427-255.500.
Sonoda, Sakae: *See*—
Shimada, Shoji; Sonoda, Sakae; and Yokoyama, Kimio, 4,344,308, Cl. 72-39.000.
Sony Corporation: *See*—
Kobori, Yuzuru, 4,345,185, Cl. 315-3.000.
Nagumo, Fumio; and Asaida, Takashi, 4,345,270, Cl. 358-44.000.
Shirota, Norihisa, 4,345,272, Cl. 358-21.00R.
Sony/Tektronix: *See*—
Takeuchi, Sumio; Murooka, Rikichi; and Sakamoto, Jun, 4,345,241, Cl. 340-347.0CC.
Soslau, Gerald. Platelet composition having improved storage stability and method therefor. 4,344,936, Cl. 424-101.000.
South Eastern Electricity Board: *See*—
Fielden, John S., 4,345,311, Cl. 364-483.000.
Sovey, James S.: *See*—
Banks, Bruce A.; Mirtich, Michael J.; and Sovey, James S., 4,344,996, Cl. 428-141.000.
Spangler, Herbert L.: *See*—
Smith, W. Christen; McGill, Terry J.; and Spangler, Herbert L., 4,344,370, Cl. 110-162.000.
Spector, George: *See*—
Jones, Jessie L.; and Spector, George, 4,344,627, Cl. 273-273.000.
Spectrol Electronics Corporation: *See*—
Riley, Richard E.; and Turner, Bradley D., 4,345,235, Cl. 338-176.000.
Spees, Arthur T., to Visu-Flex Corporation. Machine for manufacture of panel tile. 4,344,242, Cl. 40-373.000.
Sperry Corporation: *See*—
Cullen, James H., 4,344,713, Cl. 400-22.000.
De Busscher, Cyriel R. J.; Deleu, Walter V.; and Van Herpe, Francois, 4,344,443, Cl. 130-272.000.
Echols, James M.; and Bouwhuis, Richard W., 4,344,728, Cl. 414-39.000.
Griffith, Carl D.; and Oliver, Kenneth L., 4,345,195, Cl. 318-628.000.
Rainwater, Lawrence L., 4,345,256, Cl. 343-754.000.
Torland, Peter J.; and Todd, Robert R., 4,344,442, Cl. 130-27.00T.
White, Gary D., 4,345,328, Cl. 371-38.000.
Spittka, Gayle A.: *See*—
Broersma, Robert J., Jr.; and Spittka, Gayle A., 4,344,958, Cl. 424-273.00R.
SPS Technologies, Inc.: *See*—
Finkelston, Robert J., 4,344,216, Cl. 29-407.000.
Square D Company: *See*—
Kampf, Julian C.; Graefe, Richard J.; and Profio, Mark V., 4,345,288, Cl. 361-31.000.
Sridharan, Sri P.: *See*—
Penney, C. Bradford; Zabec, Glenn M.; and Sridharan, Sri P., 4,345,304, Cl. 362-183.000.
SRO Kugellagerwerke J. Schmid-Roost AG: *See*—
Borel, Denis, 4,344,657, Cl. 308-6.00C.
Stadler, Klaus: *See*—
Birgmeir, Klaus; and Stadler, Klaus, 4,344,666, Cl. 350-6.900.
Stahl, Jurgen: *See*—
Schuster, Wilhelm; and Stahl, Jurgen, 4,344,744, Cl. 417-550.000.
Stahle, Helmut: *See*—
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Muacevic, Gojko; and Traunecker, Werner, 4,344,964, Cl. 424-304.000.
Stamboulian, Nazareth: *See*—
Hollowell, William; Tanaka, Akira; Ziv, Avraham; and Stamboulian, Nazareth, 4,344,588, Cl. 242-107.40A.
Stamicarbon B.V.: *See*—
Bijen, Jan M. J. M.; and Jansen, Johann J., 4,344,804, Cl. 156-42.000.
Bijen, Jan M. J. M., 4,344,910, Cl. 264-257.000.
Bijen, Jan M. J. M., 4,345,001, Cl. 428-286.000.
Bour, Edmond H. J. P.; Brouwers, Johannes A. L.; and Warnier, Jean M. M., 4,345,065, Cl. 528-312.000.
Smith, Paul; and Lemstra, Pieter J., 4,344,908, Cl. 264-203.000.
Standard Oil Company: *See*—
Pesa, Frederick A.; and Haase, Thomas A., 4,344,866, Cl. 252-428.000.
Standard Oil Company (Indiana): *See*—
Parrish, David R., 4,344,486, Cl. 166-272.000.
Standard Telephones and Cables Limited: *See*—
Sweet, Anthony W., 4,345,115, Cl. 179-18.0FA.
Sweet, Anthony W., 4,345,117, Cl. 179-77.000.
Stanley Works, The: *See*—
Remington, John L.; and Moyer, Robert W., 4,344,368, Cl. 108-51.100.
Staples, Jack W.; and Norris, James X. Efficient second stage cooling system. 4,344,296, Cl. 62-175.000.
Stark, Charles J., to General Electric Company. Method for epoxidizing olefins. 4,344,887, Cl. 549-531.000.
Starkstrom Gummersbach GmbH: *See*—
Lemmer, Helmut, 4,345,225, Cl. 335-132.000.
Steck, Werner; Sarnecki, Wilhelm; Marosi, Laszlo; Ohlinger, Manfred; and Loeser, Werner, to BASF Aktiengesellschaft. Manufacture of acicular ferromagnetic iron particles. 4,344,791, Cl. 75-0.5AA.
Stein, Morris O., to Singer Company, The. High performance monolithic digit driver. 4,345,318, Cl. 365-196.000.
Stemme, Otto, to Agfa-Gevaert Aktiengesellschaft. Quality control method and apparatus for photographic pictures. 4,344,683, Cl. 354-106.000.
Stemme, Otto; Lermann, Peter; and Cocron, Istvan, to Agfa-Gevaert Aktiengesellschaft. Photographic camera with state-of-focus indication. 4,344,686, Cl. 354-198.000.
Stendel, Wilhelm: *See*—
Fuchs, Rainer; Naumann, Klaus; Lantzsch, Reinhard; Hagemann, Hermann; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,344,960, Cl. 424-282.000.
Fuchs, Rainer; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,344,963, Cl. 424-304.000.

Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Hammann, Ingeborg; and Stendel, Wilhelm, 4,345,078, Cl. 544-244.000.

Stephenson, Grant R.: *See*—
Kendall, John A.; Marchildon, Ernest K.; and Stephenson, Grant R., 4,344,711, Cl. 366-83.000.

Sterling, Larry D.; and Melvin, Wilbert, Jr., to International Playtex, Inc. Method to lessen the entanglement of tubular fabrics. 4,344,197, Cl. 8-150.000.

Stetter, Jorg; Homeyer, Bernhard; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. Combating pests with substituted alkanylazolyl oxime-carbamates. 4,344,953, Cl. 424-269.000.

Steuer, Herbert K., to P.I.V. Antrieb Werner Reimers GmbH & Co. KG. Side-bar chain for cone pulley transmissions. 4,344,761, Cl. 474-245.000.

Stevens, William D., to Foster Wheeler Energy Corporation. Vapor generating system utilizing integral separators and angularly arranged furnace boundary wall fluid flow tubes having rifled bores. 4,344,388, Cl. 122-235.00R.

Stewart, Carl W.: *See*—
Stewart, Owen E.; and Stewart, Carl W., 4,344,568, Cl. 237-8.00R.

Stewart, Owen E.; and Stewart, Carl W. Closed-loop heat-reclaiming system. 4,344,568, Cl. 237-8.00R.

Stewart, Patrick B.: *See*—
Cullen, Ernest; Possanza, Genus; and Stewart, Patrick B., 4,344,946, Cl. 424-250.000.

Stiles, Robert. Door edge and hinge guard. 4,344,253, Cl. 49-383.000.

Stock, Don J. R.: *See*—
Kompa, Gunter; and Stock, Don J. R., 4,344,705, Cl. 356-5.000.

Stoka, Roberto; and Lotzsch, Ulrich, to International Standard Electric Corporation. Floating caliper-spot-type disc brake. 4,344,511, Cl. 188-73.450.

Stokes, Charlie M. System for handling heavy and unwieldy vehicles. 4,344,732, Cl. 414-607.000.

Stone, Raymond. Anesthetic compositions containing benzocaine. 4,344,965, Cl. 424-310.000.

Storage Technology Corporation: *See*—
Blagaila, John H.; and Hopper, James F., 4,345,280, Cl. 360-49.000.

Story, James R.; and Sobodowski, Joseph J., IV. Apparatus and method for an electronic identification, actuation and recording system. 4,345,146, Cl. 235-381.000.

Stratmann, Josef; and Mrongowius, Klaus, to Carl Still GmbH & Co. KG., Firma. Discharging method and apparatus for dry coke cooling chambers. 4,344,823, Cl. 201-41.000.

Straub, Ferdinand: *See*—
Denzinger, Walter; Straub, Ferdinand; and Hartmann, Heinrich, 4,345,049, Cl. 525-339.000.

Strauss, Richard H. Earplugs. 4,344,425, Cl. 128-152.000.

Streamlight, Inc.: *See*—
Penney, C. Bradford; Zabec, Glenn M.; and Sridharan, Sri P., 4,345,304, Cl. 362-183.000.

Streel, Robert. Implant a geometry variable. 4,344,757, Cl. 433-173.000.

Strege, Paul E.; and Renga, James M., to Dow Chemical Company, The. Process for making alkylene carbonates. 4,344,881, Cl. 549-229.000.

Struchtrup, Karl D. S.: *See*—
Schmittbetz, Klaus; and Struchtrup, Karl D. S., 4,344,334, Cl. 74-473.00R.

Stuckey, Ronald L., to CTS Corporation. Recessed circuit module. 4,345,300, Cl. 361-386.000.

Stuermer, Paul A.; and Blazey, Richard N., to Eastman Kodak Company. Laser printer with multiple scanning beams. 4,344,677, Cl. 354-5.000.

Suarato, Antonino; Penco, Sergio; and Arcamone, Federico, to Farmitalia Carlo Erba S.p.A. Process for the preparation of 4'-deoxy-daunorubicin and 4'-deoxy-doxorubicin. 4,345,070, Cl. 536-17.00A.

Suarato, Antonio; Penco, Sergio; and Arcamone, Federico, to Farmitalia Carlo Erba S.p.A. Process for the preparation of 4'-epidaunorubicin, 3',4'-diepidaunorubicin, their doxorubicin analogs, and intermediates used in said process. 4,345,068, Cl. 536-17.00A.

Suda, Minoru: *See*—
Kondo, Kiyoshi; Takashima, Toshiyuki; and Suda, Minoru, 4,344,884, Cl. 549-273.000.

Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG: *See*—
Dietzsch, Kurt, 4,344,482, Cl. 165-172.000.

Suessenbeck, Heinrich; Siebenhofer, Gottfried; Neuper, Rienhard; and Zitz, Alfred, to Voest-Alpine Aktiengesellschaft. Valve arrangement for controlling the stroke of a telescoping prop. 4,344,354, Cl. 91-168.000.

Sugasawa, Fukashi: *See*—
Etoh, Yukihiro; Tanaka, Toshiaki; Sugasawa, Fukashi; and Iizuka, Haruhiko, 4,344,393, Cl. 123-198.00F.

Sugata, Shigeo; Tachigami, Shigeru; Kikkawa, Satoru; Umezu, Haruo; and Ohkubo, Masanori, to Technical Research and Development Institute, Japan Defence Agency; and Furukawa Electric Co., Ltd., The. High strength cable usable undersea. 4,345,112, Cl. 174-107.000.

Sugiura, Toshio: *See*—
Nakada, Akira; Sugiura, Toshio; Okamoto, Eisaku; and Yoshida, Kiyoshi, 4,344,344, Cl. 84-1.030.

Sugiyama, Katsumi; Takeda, Hideo; and Sato, Hiroko, to Ajinomoto Company Incorporated. Method of producing N-benzyloxycarbonyl-L-aspartic acid. 4,345,091, Cl. 560-163.000.

Sukolics, Ronald D., to Carl Dunmon & Associates, Inc. Apparatus for joining wall panels. 4,344,267, Cl. 52-762.000.

Sullivan, Daniel T.: *See*—
Arulpragasam, Jega A.; Giggi, Robert A.; Lary, Richard F.; and Sullivan, Daniel T., 4,345,309, Cl. 364-200.000.

Sullivan, Donald J., to United States of America, Air Force. High power microwave generator using relativistic electron beam in waveguide drift tube. 4,345,220, Cl. 331-79.000.

Sumitomo Aluminium Smelting Co., Ltd.: *See*—
Yamada, Koichi; and Shinya, Yasuo, 4,344,904, Cl. 264-66.000.

Sumitomo Chemical Company, Limited: *See*—
Kitagawa, Yoshihiko; Yuyama, Masahiro; Moritani, Masahiko; and Suzuki, Mikio, 4,344,906, Cl. 264-128.000.

Sumitomo Durez Company, Ltd.: *See*—
Matsushima, Noriaki; and Nemoto, Shigeru, 4,345,003, Cl. 428-327.000.

Sumitomo Electric Industries, Ltd.: *See*—
Uchida, Naoya; Yoshida, Masaaki; and Yamanishi, Toru, 4,344,669, Cl. 350-96.300.

Sumitomo Heavy Industries, Ltd.: *See*—
Fujita, Kenji; Korehisa, Kazuo; Asaba, Hirosi; Harada, Hideo; and Shibuya, Tsuneo, 4,344,204, Cl. 15-93.00A.

Sumitomo Metal Industries, Ltd.: *See*—
Kunitake, Tatsuro; Ohtani, Hiroo; Watanabe, Seiichi; Takigawa, Toshiji; and Matsumoto, Yoshiro, 4,344,801, Cl. 148-3.000.

Summey, Samuel T., to General Electric Company. Luminaire mounting device. 4,345,306, Cl. 362-294.000.

Sun Chemical Corporation: *See*—
North, Bernard F., 4,345,063, Cl. 528-245.000.

Sund, Lloyd P. Grain pickup. 4,344,276, Cl. 56-364.000.

Sundstrand Corporation: *See*—
Hawkins, Royal R., 4,344,328, Cl. 73-651.000.

Sung, Joseph P., to Monsanto Company. Finish monitor. 4,345,205, Cl. 324-65.00R.

Supertex, Inc.: *See*—
Blanchard, Richard A., 4,345,265, Cl. 357-23.000.

Sutcliffe, Edward Y.; and Cole, Roger A., to Santa Barbara Research Center. Supercool method for producing single crystal mercury cadmium telluride. 4,344,476, Cl. 164-76.100.

Sutton, Bernard. Pizza carrier. 4,344,534, Cl. 206-545.000.

Suzuki, Fuzio: *See*—
Hasegawa, Junzo; Kawabata, Susumu; Yoshida, Kazunori; Suzuki, Fuzio; Itoh, Yusuke; Suzuki, Hajime; Arakawa, Hiroshi; and Kobayashi, Akira, 4,344,465, Cl. 139-435.000.

Suzuki, Hajime: *See*—
Hasegawa, Junzo; Kawabata, Susumu; Yoshida, Kazunori; Suzuki, Fuzio; Itoh, Yusuke; Suzuki, Hajime; Arakawa, Hiroshi; and Kobayashi, Akira, 4,344,465, Cl. 139-435.000.

Suzuki, Makoto: *See*—
Konishi, Masami; Kuramoto, Akio; Maeda, Yorishige; Ishikawa, Norikatsu; and Suzuki, Makoto, 4,344,407, Cl. 123-661.000.

Suzuki, Mikio: *See*—
Kitagawa, Yoshihiko; Yuyama, Masahiro; Moritani, Masahiko; and Suzuki, Mikio, 4,344,906, Cl. 264-128.000.

Suzuki, Mitsuo; Tokunaga, Takeshi; Yonekura, Seiji; Matsuoka, Shigeru; and Nakamura, Kenji, to Hitachi, Ltd. Garage door operation control apparatus. 4,344,252, Cl. 49-199.000.

Swan, William E., Jr.: *See*—
Schwartz, S. Robert; Swan, William E., Jr.; Fetterman, Robert C.; and Neubaum, Victor A., deceased, 4,344,822, Cl. 201-39.000.

Swanson, Harold V.; and Thompson, Duncan M., to Babson Bros. Co. Milker. 4,344,385, Cl. 119-14.080.

Swedlow, Inc.: *See*—
Holdridge, David W., 4,344,673, Cl. 350-292.000.

Sweet, Anthony W., to Standard Telephones and Cables Limited. Telephone line interface. 4,345,115, Cl. 179-18.0FA.

Sweet, Anthony W., to Standard Telephones and Cables Limited. Telephone line feed circuit. 4,345,117, Cl. 179-77.000.

Sybron Corporation: *See*—
Hirth, Emil, 4,344,594, Cl. 248-421.000.

Symborski, Alex P.; and Cunningham, Cecil R., to Owens-Corning Fiberglas Corporation. Method and apparatus for gathering strand material. 4,344,786, Cl. 65-2.000.

Syntex (U.S.A.) Inc.: *See*—
Muchowski, Joseph M., 4,344,943, Cl. 424-245.000.

Synthelabo: *See*—
Leclerc, Jean; and de Rudder, Jean, 4,344,935, Cl. 424-89.000.

Szabo, Lajos: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Dancsi, Lajos; Keve, Tibor; and Gazdac, Maria, 4,345,082, Cl. 546-51.000.

Szabo, William. Pivoted weight lifting apparatus. 4,344,619, Cl. 272-117.000.

Szadkowski, Stanislav, to Vesuvius International Corporation. Self-adjusting arrangement for refractory plates of slide gate mechanism. 4,344,550, Cl. 222-600.000.

Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Dancsi, Lajos; Keve, Tibor; and Gazdac, Maria, to Richter Gedeon Vegyeszeti Gyar Rt. Process for the preparation of hydroxyamino-eburnane derivatives and octahydroindoloquinolizine intermediates. 4,345,082, Cl. 546-51.000.

Szantay, Csaba: *See*—
Novak, Lajos; Szantay, Csaba; Rohaly, Janos; Kis-Tamas, Attila; Varjas, Laszlo; and Csutak, Janos, 4,344,959, Cl. 424-279.000.

Szepesi, Gabor: *See*—
Nagy, Geza T.; Szepesi, Gabor; and Gazdag, Maria, 4,344,950, Cl. 424-262.000.

Szulczyk, Andreas, to Degussa AG. Solder alloy for the direct soldering of oxide containing silver catalyst on catalyst carrier. 4,344,794, Cl. 75-173.00C.

Tabuchi, Kenji: *See*—
Oka, Tateki; Tabuchi, Kenji; and Tanaka, Susumu, 4,345,014, Cl. 430-122.000.

Tachigami, Shigeru: *See*—
Sugata, Shigeo; Tachigami, Shigeru; Kikkawa, Satoru; Umezu, Haruo; and Ohkubo, Masanori, 4,345,112, Cl. 174-107.000.

Taff, James T.: *See*—
Lesher, Howard D.; and Taff, James T., 4,344,553, Cl. 226-168.000.

Takada, Shigetaka; and Satoh, Yoji, to Aisan Kogyo Kabushiki Kaisha. Carburetor controlling system. 4,344,898, Cl. 261-39.00E.

Takagi, Yasuo: *See*—
Iijima, Tamotsu; and Takagi, Yasuo, 4,344,392, Cl. 123-179.00G.

Takahashi, Kazuyoshi: *See*—
Minakawa, Yoshimitsu; Ishibashi, Yoji; Sato, Isao; Uchiyama, Yoshihiro; and Takahashi, Kazuyoshi, 4,344,280, Cl. 60-39009.00F.

Takahashi, Michiko: *See*—
Shirato, Yoshiaki; Takatori, Yasushi; Hara, Toshitami; Nishimura, Yukuo; and Takahashi, Michiko, 4,345,262, Cl. 346-140.00R.

Takahashi, Osamu; Ohki, Nobutaka; and Aoki, Kozo, to Fuji Photo Film Co., Ltd. Color photographic sensitive material. 4,345,016, Cl. 430-214.000.

Takahashi, Yoshihiro, to Xertex Corporation. Determination of total carbon in liquid samples. 4,344,918, Cl. 422-80.000.

Takai, Haruki; Teranishi, Masayuki; Nakamizo, Nobuhiro; Kasuya, Yutaka; and Kubo, Kazuhiro, to Kyowa Hakko Kogyo Co., Ltd. Piperidine derivatives and pharmaceutical compositions containing same. 4,344,948, Cl. 424-251.000.

Takai, Haruki: *See*—
Teranishi, Masayuki; Obase, Hiroyuki; Takai, Haruki; Kubo, Kazuhiro; and Kasuya, Yutaka, 4,344,945, Cl. 424-248.520.

Takai, Yoshinori: *See*—
Saito, Masato; Tsuchihashi, Michihiro; Takai, Yoshinori; Fukuyama, Keiji; and Watanabe, Keiji, 4,345,186, Cl. 315-49.000.

Takamori, Kazumi: *See*—
Tanabe, Tetsuo; Takamori, Kazumi; Matueda, Akira; Matsui, Kiyoshi; Omura, Junichi; and Miyamoto, Hitoshi, 4,344,219, Cl. 29-564.600.

Takase, Akio; Horikoshi, Hiroshi; and Kasada, Toshio, to Mitsubishi Denki Kabushiki Kaisha. Cooking apparatus. 4,345,132, Cl. 219-10.55B.

Takashima, Toshiyuki: *See*—
Kondo, Kiyoshi; Takashima, Toshiyuki; and Suda, Minoru, 4,344,884, Cl. 549-273.000.

Takata, Kenichi: *See*—
Kondo, Tadashige; Ohno, Susumu; Takata, Kenichi; and Inaga, Hisashi, 4,344,395, Cl. 123-335.000.

Takata, Tadanobu: *See*—
Komiyama, Tadashi; Oi, Shoichi; Ohnishi, Noriaki; Mori, Shinya; Takata, Tadanobu; and Kubo, Isao, 4,344,837, Cl. 208-8.0LE.

Takatori, Yasushi: *See*—
Shirato, Yoshiaki; Takatori, Yasushi; Hara, Toshitami; Nishimura, Yukuo; and Takahashi, Michiko, 4,345,262, Cl. 346-140.00R.

Takats, Imre J.; and Chenoweth, Charles C., to Boeing Company, The. Two/one (2/1) fail operational electrohydraulic servoactuator. 4,345,191, Cl. 318-564.000.

Takayama, Hiroaki; Yamada, Sachiko; and Ohmori, Masayuki, to Chugai Seiyaku Kabushiki Kaisha. 24,25-Dihydroxycholestans and process for preparing the same. 4,344,888, Cl. 260-397.200.

Takayanagi, Eiichi: *See*—
Okutomi, Tsutomu; Iida, Masachika; Kuwabara, Kazuyoshi; Yoshino, Hisashi; and Takayanagi, Eiichi, 4,345,130, Cl. 200-268.000.

Takeda, Fumio: *See*—
Komuro, Keigo; Yamada, Matsuichi; Aoki, Katsuhiko; Yoshikawa, Yoshihiko; Itoh, Fumio; Takeda, Fumio; and Ishida, Osami, 4,345,255, Cl. 343-100.0PE.

Takeda, Hideo: *See*—
Sugiyama, Katsumi; Takeda, Hideo; and Sato, Hiroko, 4,345,091, Cl. 560-163.000.

Takeda, Nobuyuki; and Iwata, Tadao, to Mitsui Petrochemical Industries, Ltd. High-molecular-weight novolak types substituted phenolic resins and process for preparation thereof. 4,345,054, Cl. 525-480.000.

Takeda, Shinichi: *See*—
Nagura, Kenji; Takeda, Shinichi; Namie, Koshi; Fujii, Takao; Yamamoto, Michio; and Yokoyama, Seiichi, 4,345,089, Cl. 560-77.000.

Takemura, Seinosuke, to Daiwa Shinku Corporation. Quartz tuning fork electro-acoustic transducer. 4,345,118, Cl. 179-110.00A.

Takemura, Yasuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Image pick-up apparatus. 4,345,269, Cl. 358-43.000.

Takeuchi, Sumio; Murooka, Rikichi; and Sakamoto, Jun, to Sony/Tektronix. Analog-to-digital conversion method and apparatus. 4,345,241, Cl. 340-347.0CC.

Taki, Tomohiko, to Hitachi, Ltd. Automatic water supply system. 4,344,741, Cl. 417-28.000.

Takigawa, Toshiji: *See*—
Kunitake, Tatsuro; Ohtani, Hiroo; Watanabe, Seiichi; Takigawa, Toshiji; and Matsumoto, Yoshiro, 4,344,801, Cl. 148-3.000.

Tamaki, Shigeo: *See*—
Hozumi, Kazuhiro; and Tamaki, Shigeo, 4,344,603, Cl. 251-130.000.

Tamura, Hisashi; Taniguchi, Naozo; and Ishikawa, Hirotoshi, to Yokogawa Electric Works, Ltd. Method and apparatus for measuring the moisture content of paper. 4,345,150, Cl. 250-339.000.

Tanabe, Tetsuo; Takamori, Kazumi; Matueda, Akira; Matsui, Kiyoshi; Omura, Junichi; and Miyamoto, Hitoshi, to Matsushita Electric Industrial Co., Ltd. Apparatus for arranging parts. 4,344,219, Cl. 29-564.600.

Tanaka, Akihiko: *See*—
Nakamura, Takeshi; and Tanaka, Akihiko, 4,344,517, Cl. 192-98.000.

Tanaka, Akira: *See*—
Hollowell, William; Tanaka, Akira; Ziv, Avraham; and Stamboulian, Nazareth, 4,344,588, Cl. 242-107.40A.

Tanaka, Junzo; and Orita, Masatomo, to Matsushita Electric Industrial Co., Ltd. High frequency heating apparatus. 4,345,134, Cl. 219-10.55B.

Tanaka, Susumu: *See*—
Oka, Tateki; Tabuchi, Kenji; and Tanaka, Susumu, 4,345,014, Cl. 430-122.000.

Tanaka, Toshiaki: *See*—
Etoh, Yukihiro; Tanaka, Toshiaki; Sugasawa, Fukashi; and Iizuka, Haruhiko, 4,344,393, Cl. 123-198.00F.

Taniguchi, Naozo: *See*—
Tamura, Hisashi; Taniguchi, Naozo; and Ishikawa, Hirotoshi, 4,345,150, Cl. 250-339.000.

Taniguchi, Nobuyuki: *See*—
Ishida, Tokuji; Taniguchi, Nobuyuki; Itoh, Masatoshi; Matsumoto, Toshiaki; Izumi, Tatsuro; and Niwa, Masatake, 4,344,680, Cl. 354-33.000.

Tanioka, Takashi: *See*—
Fujisawa, Tetsuo; and Tanioka, Takashi, 4,344,538, Cl. 209-144.000.

Tarng, Ming L.: *See*—
Goodman, Alvin M.; and Tarng, Ming L., 4,344,985, Cl. 427-85.000.

Taylor, Frank. Chillerwell cooler. 4,344,300, Cl. 62-457.000.

Taylor, Frank. Beverage cooler construction. 4,344,301, Cl. 62-457.000.

Taylor, Kenneth R., to Atlantic Richfield Company. Cold weather coupling device. 4,344,718, Cl. 403-287.000.

Tazaki, Shigemitsu; and Kyogoku, Hiroshi, to Canon Kabushiki Kaisha. Recording apparatus. 4,345,263, Cl. 346-140.00R.

Teche, Andre: *See*—
Martel, Jacques; Tessier, Jean; Teche, Andre; and Demoute, Jean-Pierre, 4,344,895, Cl. 260-465.00F.

Technical Research and Development Institute, Japan Defence Agency: *See*—
Sugata, Shigeo; Tachigami, Shigeru; Kikkawa, Satoru; Umezu, Haruo; and Ohkubo, Masanori, 4,345,112, Cl. 174-107.000.

Technical Wire Products, Inc.: *See*—
Dalamangas, Chris A.; and Piccirillo, Thomas P., 4,344,662, Cl. 339-59.00M.

Teijin Limited: *See*—
Akagi, Noriyuki; Ogawa, Yoshinari; and Sakai, Kouichi, 4,344,874, Cl. 524-296.000.

Teixeira, Theodore M.: *See*—
Allaway, Philip N.; Baginski, Richard M.; Liu, Don K. K.; and Teixeira, Theodore M., 4,344,871, Cl. 252-531.000.

Tempo Sanys: *See*—
Caumont, Jean-Francois, 4,344,426, Cl. 128-156.000.

Tennant, Donald M.: *See*—
Craighead, Harold G.; Howard, Richard E.; and Tennant, Donald M., 4,344,816, Cl. 156-643.000.

Tenneco Chemicals, Inc.: *See*—
Ejk, Adam J.; and Krzywicki, Donald J., 4,345,046, Cl. 524-223.000.

Tenner, Richard B., to Eaton Corporation. Miniature lighted pivoted actuator switch with integral lock. 4,345,121, Cl. 200-42.00R.

Terabayashi, Gosaku, to Toyota Jidosha Kogyo Kabushiki Kaisha. Passive seatbelt system. 4,344,502, Cl. 180-268.000.

Teranishi, Masayuki; Obase, Hiroyuki; Takai, Haruki; Kubo, Kazuhiro; and Kasuya, Yutaka, to Kyowa Hakko Kogyo Co., Ltd. Piperidine derivatives. 4,344,945, Cl. 424-248.520.

Teranishi, Masayuki: *See*—
Takai, Haruki; Teranishi, Masayuki; Nakamizo, Nobuhiro; Kasuya, Yutaka; and Kubo, Kazuhiro, 4,344,948, Cl. 424-251.000.

Terayama, Takao: *See*—
Miyakawa, Seii; Kawauchi, Akira; Iijima, Kazunori; Terayama, Takao; Yoshida, Masashi; and Kawase, Hideyuki, 4,345,282, Cl. 360-85.000.

Tessier, Jean: *See*—
Martel, Jacques; Tessier, Jean; Teche, Andre; and Demoute, Jean-Pierre, 4,344,895, Cl. 260-465.00F.

Testut-Aequitas: *See*—
Langlais, Jacques F.; and Valadier, Jean-Claude, 4,344,496, Cl. 177-211.000.

Tex Innovation AB: *See*—
Andersson, Sture, 4,344,270, Cl. 53-511.000.

Texaco Inc.: *See*—
Kalfoglou, George, 4,344,487, Cl. 166-274.000.
Petty, Randall H.; and Bartley, Burton H., 4,344,926, Cl. 423-244.000.
Reinhard, Russell R.; Dorawala, Tansukhlal G.; and Kerr, Edwin R., 4,344,865, Cl. 252-420.000.

Texas Instruments Incorporated: *See*—
Harris, William S., Jr., 4,345,171, Cl. 307-560.000.
Parsons, Robert, 4,345,243, Cl. 340-728.000.

Textilma AG: *See*—
Bucher, Robert R.; and Riner, Felix, 4,344,307, Cl. 66-84.00R.
Muller, Jakob; and Diesner, Ferdinand, 4,344,463, Cl. 139-383.00R.
Theeuwes, Felix: *See*—
Bonsen, Pieter; Wong, Patrick S.; and Theeuwes, Felix, 4,344,929, Cl. 424-15.000.
Thelen, Bernd: *See*—
Auge, Wolfgang; Thelen, Bernd; Thiem, Karl-Werner; and Neeff, Rutger, 4,344,827, Cl. 203-13.000.
Theuerkauf, Heinz: *See*—
Geiger, Istvan; and Theuerkauf, Heinz, 4,344,397, Cl. 123-339.000.
Thiele, Dietrich, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method and apparatus for removing waste products from solutions of fission products. 4,344,872, Cl. 252-629.000.
Thiem, Karl-Werner: *See*—
Auge, Wolfgang; Thelen, Bernd; Thiem, Karl-Werner; and Neeff, Rutger, 4,344,827, Cl. 203-13.000.
Thirouard, Michel: *See*—
Arquie, Louis; Bricot, Claude; and Thirouard, Michel, 4,345,321, Cl. 369-46.000.
Thom, Wenzel W., to Architectural Art Mfg., Inc. Internally expanding railing coupling. 4,344,719, Cl. 403-297.000.
Thomas, Lyell J., Jr.: *See*—
Bessman, Samuel P.; and Thomas, Lyell J., Jr., 4,344,743, Cl. 417-317.000.
Thomas, R. Gordon: *See*—
Masterson, Robert C., Jr.; Thomas, R. Gordon; and Johnson, John G., 4,344,656, Cl. 303-2.000.
Thompson, Brett A.; Webb, John A.; and White, Martin B., to Membrain Limited. Fault location system with enhanced noise immunity. 4,345,201, Cl. 324-52.000.
Thompson, Buster R., to Elk River Resources, Inc. Method of operation of high-speed coke oven battery. 4,344,820, Cl. 201-15.000.
Thompson, Charles E.; and Herring, Samuel H., to Huyck Corporation. Endless forming fabrics with bi-crimp characteristics. 4,344,464, Cl. 139-383.00A.
Thompson, Duncan M.: *See*—
Swanson, Harold V.; and Thompson, Duncan M., 4,344,385, Cl. 119-14.080.
Thompson, John S.; and Jadlocki, Joseph F., Jr., to FMC Corporation. Smoked fish products which inhibit the growth of *Clostridium botulinum* and the formation of enterotoxin. 4,344,977, Cl. 426-532.000.
Thomson-CSF: *See*—
Arquie, Louis; Bricot, Claude; and Thirouard, Michel, 4,345,321, Cl. 369-46.000.
Carre, Roland; and Doriath, Georges, 4,345,252, Cl. 343-5.0NQ.
Kaplan, Daniel; Landouar, Pierre; and Criton, Eric, 4,344,984, Cl. 427-74.000.
Klausz, Remy, 4,345,157, Cl. 378-19.000.
van den Driessche, Michel, 4,345,246, Cl. 340-748.000.
Thornton, Alan; and Uttley, John S., to Bondina Ltd. Multizonal binder impregnation. 4,344,989, Cl. 427-286.000.
Thornton, James F.: *See*—
Thornton, William E.; and Thornton, James F., 4,345,247, Cl. 340-755.000.
Thornton, William E.; and Thornton, James F. Display system for steady state waves. 4,345,247, Cl. 340-755.000.
Thrash, Tommy: *See*—
Cowan, Jack C.; and Thrash, Tommy, 4,345,039, Cl. 521-48.000.
Thurm, Siegfried; and Bunge, Konrad, to Agfa-Gevaert Aktiengesellschaft. Method of determining correction parameters for use in light-amount adjustment in a color copying operation. 4,344,704, Cl. 355-77.000.
Thuy, Pham D., to Societe Francaise d'Equipements pour la Navigation Aerienne. Self-monitored process control device. 4,345,327, Cl. 371-9.000.
Thyret, Helmut E.; Balwe, Thomas; Beier, Gerhard; and Bauer, Johann, to Wacker-Chemie GmbH. Process for suspension polymerization of vinyl chloride employing mixed protective colloids. 4,345,056, Cl. 526-200.000.
Tiberg, Magnus G. G., to Aktiebolaget SKF. Method and apparatus for replacing the electrodes of an electric arc furnace. 4,345,333, Cl. 373-94.000.
Tischer, Werner: *See*—
Liebert, Karl-Heinz; Tischer, Werner; and Deppenbrock, Christoph, 4,344,283, Cl. 60-384.000.
Toba, Susumu: *See*—
Matsumoto, Tadashi; Kuratani, Osamu; Hirose, Yasunori; and Toba, Susumu, 4,345,102, Cl. 568-678.000.
Todd, Robert R.: *See*—
Torland, Peter J.; and Todd, Robert R., 4,344,442, Cl. 130-27.00T.
Togashi, Seigo; and Tsuzuki, Akira, to Citizen Watch Company Limited. Liquid crystal display device with write-in capability. 4,345,248, Cl. 340-784.000.
Togashi, Seigo, to Citizen Watch Company Limited. Liquid crystal display panel. 4,345,249, Cl. 340-784.000.
Toki, Tadaaki: *See*—
Nishiyama, Ryuzo; Haga, Takahiro; Toki, Tadaaki; Koyanagi, Tohru; and Murai, Shigeo, 4,344,951, Cl. 424-263.000.
Tokuda, Kanji, to Fuji Photo Film Co., Ltd. Method and apparatus for exposure quantity control in automatic color printer. 4,344,708, Cl. 356-404.000.
Tokunaga, Takeshi: *See*—
Suzuki, Mitsuo; Tokunaga, Takeshi; Yonekura, Seiji; Matsuoka, Shigeru; and Nakamura, Kenji, 4,344,252, Cl. 49-199.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Ishikawa, Masaaki, 4,345,277, Cl. 358-293.000.
Matsumoto, Hiroshi; and Ogura, Tomoki, 4,344,697, Cl. 355-14.00C.
Oda, Goro, 4,344,692, Cl. 355-3.0DD.
Okutomi, Tsutomu; Iida, Masachika; Kuwabara, Kazuyoshi; Yoshino, Hisashi; and Takayanagi, Eiichi, 4,345,130, Cl. 200-268.000.
Takemura, Yasuo, 4,345,269, Cl. 358-43.000.
Tsunoda, Sachio, 4,344,735, Cl. 415-1.000.
Tolgyesi, Eva; and Bresak, Ann F., to Gillette Company, The. Reactive silicone hair setting compositions. 4,344,763, Cl. 8-127.510.
Tolle, Gunter, to Pfaff Industriemaschinen GmbH. Sewing machine with a looper arranged above the point of stitch formation. 4,344,375, Cl. 112-131.000.
Toman, George M.: *See*—
Bhatia, Chandrakant; Toman, George M.; and Bock, Thomas J., 4,344,376, Cl. 112-200.000.
Tomaszek, Paul A.: *See*—
Mouyard, Arthur A.; Hamby, Michael V.; and Tomaszek, Paul A., 4,345,308, Cl. 362-332.000.
Tomcufcik, Andrew S.; Wright, William B., Jr.; and Marsico, Joseph W., Jr., to American Cyanamid Company. 2,3-Disubstituted-2,3,5,6,7,8-hexahydro-thiazolo[3,2-a]-[1,3]diazepin-3-ols. 4,344,954, Cl. 424-270.000.
Tompkins, Russell E.: *See*—
Alley, Robert P.; and Tompkins, Russell E., 4,345,229, Cl. 336-83.000.
Tonomura, Yoshinobu: *See*—
Hanyu, Susumu; Tonomura, Yoshinobu; and Watanabe, Kazuo, 4,345,196, Cl. 318-812.000.
Tonooka, Keisuke: *See*—
Wakamatsu, Atsuyuki; and Tonooka, Keisuke, 4,344,268, Cl. 53-384.000.
Top-Element Bauelemente fur Innenausbau & Raumgestaltung GmbH & Co. KG: *See*—
Langenhorst, Gunter, 4,344,258, Cl. 49-504.000.
Torland, Peter J.; and Todd, Robert R., to Sperry Corporation. Anti-wrap apparatus. 4,344,442, Cl. 130-27.00T.
Tournes, Christian: *See*—
Doucet, Henri; and Tournes, Christian, 4,345,329, Cl. 372-2.000.
Tourre, Raymond, to S.A. VAL-REX. Plate for card display board. 4,344,241, Cl. 40-124.200.
Townley, J. O. Inclined static deoiler and conditioner for treating ore. 4,344,844, Cl. 209-168.000.
Toyo Jozo Kabushiki Kaisha: *See*—
Sakakibara, Hideo; Fujiwara, Tatsuro; Okegawa, Osamu; Honda, Eiichi; Watanabe, Susumu; and Matsuda, Tetsuo, 4,345,069, Cl. 536-7.100.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Idogaki, Takaharu; Kawai, Hisasi; Matsui, Takeshi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,345,228, Cl. 335-222.000.
Inoue, Tokuta; Nakanishi, Kiyoshi; Kanda, Mutsumi; Nakada, Masahiko; and Matsuura, Toshiharu, 4,344,408, Cl. 123-661.000.
Konishi, Masami; Kuramoto, Akio; Maeda, Yorishige; Ishikawa, Norikatsu; and Suzuki, Makoto, 4,344,407, Cl. 123-661.000.
Terabayashi, Gosaku, 4,344,502, Cl. 180-268.000.
Tran, Duc T., to C.G.R. MeV. Microwave resonant system with dual resonant frequency and a cyclotron fitted with such a system. 4,345,210, Cl. 328-234.000.
Trane Company, The: *See*—
Gallagher, John P., Jr., 4,344,752, Cl. 431-354.000.
Renken, Michael J.; and Simmons, Billy P., 4,344,330, Cl. 73-861.660.
Traunecker, Werner: *See*—
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Muacevic, Gojko; and Traunecker, Werner, 4,344,964, Cl. 424-304.000.
Trenschel, Donald R.; and Aho, Wilho V., Jr., to United Technologies Corporation. Rotor assembly. 4,344,740, Cl. 416-221.000.
Trisolini, George S. Cleaning apparatus. 4,344,201, Cl. 15-3.000.
Truman, Peter T.: *See*—
Eastcott, Peter deH.; Truman, Peter T.; and Scuccato, Serge L., 4,345,123, Cl. 200-52.00R.
Trutzscher GmbH & Co. KG: *See*—
Leifeld, Ferdinand, 4,344,843, Cl. 209-143.000.
TRW Inc.: *See*—
Hayden, Rodney, 4,345,227, Cl. 335-186.000.
Tsai, Robert C.; and Kidwell, William J., to Singer Company, The. Color display system. 4,345,258, Cl. 346-17.000.
Tsuchihashi, Michihiro: *See*—
Saito, Masato; Tsuchihashi, Michihiro; Takai, Yoshinori; Fukuyama, Keiji; and Watanabe, Keiji, 4,345,186, Cl. 315-49.000.
Tsuchiya, Tomio: *See*—
Sato, Takashi; Tsuchiya, Tomio; and Matushima, Yasuo, 4,345,114, Cl. 179-6.160.
Tsuda, Nobuaki: *See*—
Iriguchi, Norio; Unno, Hiroshi; and Tsuda, Nobuaki, 4,344,560, Cl. 233-19.00A.
Tsuk, Andrew G.: *See*—
Martin, Frederick H.; and Tsuk, Andrew G., 4,344,934, Cl. 424-80.000.
Tsukaya, Takashi, to Olympus Optical Co., Ltd. Automatic photoflash device. 4,344,684, Cl. 354-128.000.
Tsunoda, Sachio, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of controlling two-stage hydraulic pump-turbines. 4,344,735, Cl. 415-1.000.

Tsuzuki, Akira: *See—*
Togashi, Seigo; and Tsuzuki, Akira, 4,345,248, Cl. 340-784.000.
Tuchenhagen, Otto A. P.; Mieth, Hans O. E.; and Coura, Herbert R., to Otto Tuchenhagen GmbH & Co. KG. Pipeline switch with leakage control and cleanable leakage cavity. 4,344,453, Cl. 137-240.000.
Turner, Bradley D.: *See—*
Riley, Richard E.; and Turner, Bradley D., 4,345,235, Cl. 338-176.000.
Turubuchi, Yasuo: *See—*
Nezu, Takao; and Turubuchi, Yasuo, 4,344,703, Cl. 355-76.000.
Tuthill Corporation: *See—*
Norton, James F.; Silagy, Richard J.; and Antoniw, Walter W., 4,344,455, Cl. 137-329.400.
Tyke, Charles R. Signage system and method of making same. 4,344,244, Cl. 40-611.000.
Tyler, Loren E. Positioning apparatus for boom structures. 4,344,572, Cl. 239-168.000.
Tyree, Lewis, Jr.; Missig, James R.; and Rhoades, George D., to Liquid Carbonic Corporation, by said James R. Missing and George D. Rhoades. Cryogenic cabinet freezer. 4,344,291, Cl. 62-62.000.
Uchida, Naoya; Yoshida, Masaaki; and Yamanishi, Toru, to Nippon Telegraph & Telephone Corporation; and Sumitomo Electric Industries, Ltd. Coated glass fibers for optical transmission. 4,344,669, Cl. 350-96.300.
Uchiyama, Yoshihiro: *See—*
Minakawa, Yoshimitsu; Ishibashi, Yoji; Sato, Isao; Uchiyama, Yoshihiro; and Takahashi, Kazuyoshi, 4,344,280, Cl. 60-39009.00F.
Ueno, Fumito; and Fukuhara, Kunio, to Daikin Kogyo Co., Ltd. Refrigeration system. 4,344,297, Cl. 62-196.00C.
Ueno, Susumu: *See—*
Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, 4,344,981, Cl. 427-40.000.
Ueno, Yoshiki: *See—*
Hattori, Tadashi; and Ueno, Yoshiki, 4,344,317, Cl. 73-23.000.
Umezu, Haruo: *See—*
Sugata, Shigeo; Tachigami, Shigeru; Kikkawa, Satoru; Umezu, Haruo; and Ohkubo, Masanori, 4,345,112, Cl. 174-107.000.
Umsonst, Gerhard; Kolliker, Hans P.; and Jost, Max, to Ciba-Geigy Corporation. Process for coloring linear polyesters in the melt. 4,344,767, Cl. 524-159.000.
Unger, Burton A.: *See—*
Bulger, Gary A.; Heck, Lyle D.; Huttemann, Robert D.; Morabito, Joseph M.; Pitetti, Raymond C.; Unger, Burton A.; and Vallere, Donald J., 4,344,223, Cl. 29-577.00C.
Unimax Switch Limited: *See—*
Henville, Michael I., 4,345,125, Cl. 200-67.00D.
Union Carbide Corporation: *See—*
Cropley, Jean B., 4,345,104, Cl. 568-852.000.
Higgins, Philip K., 4,345,139, Cl. 219-137.0PS.
Kaplan, Leonard, 4,345,103, Cl. 568-840.000.
Ramachandran, Sundaresan, 4,344,992, Cl. 427-430.100.
Sherman, John D.; and Ross, Ronald J., 4,344,851, Cl. 210-670.000.
Vick, Steven C.; and Kanner, Bernard, 4,345,088, Cl. 556-410.000.
Union Oil Company of California: *See—*
Young, Donald C.; and Green, James A., II, 4,345,099, Cl. 564-63.000.
Union Special Corp: *See—*
Bhatia, Chandrakant; Toman, George M.; and Bock, Thomas J., 4,344,376, Cl. 112-200.000.
United States Filter Corporation: *See—*
Higgins, Frank; Lautenshlager, Gilbert G.; and Bunn, Billy A., 4,344,781, Cl. 55-379.000.
United States of America
Agriculture: *See—*
Shasha, Baruch S.; Doane, William M.; and Russell, Charles R., deceased, 4,344,857, Cl. 252-316.000.
Air Force: *See—*
Skomal, Edward N., 4,345,254, Cl. 343-18.00B.
Sullivan, Donald J., 4,345,220, Cl. 331-79.000.
Army: *See—*
Bainbridge, Augustus S., 4,345,154, Cl. 250-375.000.
Energy: *See—*
Abbin, Joseph P., Jr.; Devaney, Howard F.; and Hake, Lewis W., 4,345,124, Cl. 200-61.530.
Christiansen, David W., 4,344,915, Cl. 376-437.000.
Dolbeare, Frank A., 4,345,027, Cl. 435-21.000.
Green, Walter L., 4,345,194, Cl. 318-621.000.
Maniscalco, James A.; and Meier, Wayne R., 4,344,911, Cl. 376-102.000.
Marchant, David D.; and Lytle, John M., 4,345,173, Cl. 310-11.000.
Meyer, James A., 4,344,449, Cl. 137-1.000.
Rampolla, Donald S., 4,344,912, Cl. 376-180.000.
Rosa, Jerry M., 4,344,914, Cl. 376-437.000.
Seppala, Lynn G.; and Haas, Roger A., 4,345,212, Cl. 330-4.300.
Health, Education and Welfare: *See—*
Schultz, Jerome S., 4,344,438, Cl. 128-634.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Wang, Taylor G.; and Elleman, Daniel D. Method and apparatus for producing gas-filled hollow spheres. 4,344,787, Cl. 65-21.400.
National Aeronautics and Space Administration: *See—*
Banks, Bruce A.; Mirtich, Michael J.; and Sovey, James S., 4,344,996, Cl. 428-141.000.
Jackson, Liam R., 4,344,591, Cl. 244-158.00A.
Yin, Lo I., 4,345,153, Cl. 250-369.000.
Navy: *See—*
Begeman, Robert H.; Sanderson, Barry D.; Weiss, Donald C.; and Zeph, David L., 4,345,251, Cl. 340-825.860.
Bertrand, Richard D.; Chingas, Gerard C.; Garroway, Allen N.; and Moniz, William B., 4,345,207, Cl. 324-308.000.
Parks, Albert R., 4,344,875, Cl. 424-78.000.
Yoder, Max N., 4,344,980, Cl. 427-38.000.
U.S. Philips Corporation: *See—*
Haes, Freddy; Reynhout, Cornelis M.; Hermes, Guillaume M. P. G.; and Boiten, Ebbe, 4,344,228, Cl. 30-43.900.
Hirsch, Hans J.; and Dannert, Horst, 4,345,012, Cl. 430-48.000.
Maryschka, Gerhard, 4,345,283, Cl. 360-96.600.
United Technologies Corporation: *See—*
Anders, Larry E., 4,344,282, Cl. 60-226.00R.
Breault, Richard D., 4,345,008, Cl. 429-26.000.
Fahle, Ronald W.; and Reiser, Carl A., 4,345,009, Cl. 429-37.000.
Grasso, Albert P.; and Lane, John W., 4,344,849, Cl. 210-662.000.
Grasso, Albert P., 4,344,850, Cl. 210-664.000.
Grudkowski, Thomas W.; and Gilden, Meyer, 4,345,176, Cl. 310-313.00A.
Kelly, Wallace N.; and Breunig, Roger D., 4,344,738, Cl. 416-95.000.
Trenschel, Donald R.; and Aho, Wilho V., Jr., 4,344,740, Cl. 416-221.000.
Urie, Robert G.; and Kowinski, John F., 4,344,481, Cl. 165-166.000.
University of California, The Regents of the: *See—*
Fahmy, Mohamed A. H.; and Fukuto, Tetsuo R., 4,344,883, Cl. 549-467.000.
Parsons, James D.; and Yue, Alfred S., 4,345,177, Cl. 313-95.000.
Shaffer, Steven D.; Kienitz, L. Michael; Pitts, James N., Jr.; and Bliss, Richard D., 4,344,712, Cl. 366-108.000.
University of Delaware: *See—*
Yolles, Seymour, 4,344,431, Cl. 128-260.000.
University of Exeter: *See—*
Lee, Alan J. C.; and Ling, Robin S. M., 4,344,190, Cl. 3-1.900.
University of Nebraska, The Board of Regents of the: *See—*
Edling, Robert J., 4,344,251, Cl. 47-80.000.
Unno, Hiroshi: *See—*
Iriguchi, Norio; Unno, Hiroshi; and Tsuda, Nobuaki, 4,344,560, Cl. 233-19.00A.
UOP Inc.: *See—*
Levy, Joseph, 4,344,861, Cl. 252-391.000.
Upjohn Company, The: *See—*
White, David R., 4,344,882, Cl. 549-387.000.
White, David R., 4,345,086, Cl. 549-16.000.
Wovcha, Merle G.; and Biggs, Candice B., 4,345,029, Cl. 435-55.000.
Wovcha, Merle G.; and Biggs, Candice B., 4,345,030, Cl. 435-55.000.
Wovcha, Merle G.; Biggs, Candice B.; and Pyke, Thomas R., 4,345,033, Cl. 435-253.000.
Wovcha, Merle G.; and Brooks, Kevin E., 4,345,034, Cl. 435-253.000.
Urie, Robert G.; and Kowinski, John F., to United Technologies Corporation. Counterflow heat exchanger construction. 4,344,481, Cl. 165-166.000.
USM Corporation: *See—*
Bouzianis, George J.; Hollick, John G.; McIlvin, Donald B.; and Sillars, Frederick S., 4,344,199, Cl. 12-54.300.
Ustin, George. Screw-on electrical connector. 4,345,110, Cl. 174-87.000.
Uttley, John S.: *See—*
Thornton, Alan; and Uttley, John S., 4,344,989, Cl. 427-286.000.
Valadier, Jean-Claude: *See—*
Langlais, Jacques F.; and Valadier, Jean-Claude, 4,344,496, Cl. 177-211.000.
Vallere, Donald J.: *See—*
Bulger, Gary A.; Heck, Lyle D.; Huttemann, Robert D.; Morabito, Joseph M.; Pitetti, Raymond C.; Unger, Burton A.; and Vallere, Donald J., 4,344,223, Cl. 29-577.00C.
van den Driessche, Michel, to Thomson-CSF. Synchronization device for a character-generating circuit and a vertical scanning circuit and television receiver comprising such a device. 4,345,246, Cl. 340-748.000.
van der Lely, Ary, to C. Van der Lely N.V. Soil cultivating implement. 4,344,490, Cl. 172-253.000.
van der Lely, Ary; Bom, Cornelis J. G.; and Kuipers, Arie, to C. van der Lely N.V. Tractor with anti-slipping and overloading controls. 4,344,499, Cl. 180-197.000.
van der Lely, Cornelis. Tank for transporting liquids. 4,344,636, Cl. 280-5.00C.
Van Der Linden, Roy E., to Reliable Security Systems, Inc. Exterior operating arrangement for emergency exit doors with delayed opening feature. 4,344,647, Cl. 292-201.000.
van Gogh, Johan: *See—*
Ramsbotham, John; and van Gogh, Johan, 4,345,060, Cl. 528-103.000.
Van Herpe, Francois: *See—*
De Busscher, Cyriel R. J.; Deleu, Walter V.; and Van Herpe, Francois, 4,344,443, Cl. 130-272.000.
Van Horne, Arthur C.; and Yarp, Russel E., to Dataproducts Corporation. Means for attaching a tractor drive assembly to a platen. 4,344,715, Cl. 400-616.100.

Van Noord, Andrew J. Table with extensible top. 4,344,369, Cl. 108-84.000.

VanRhijn, Wilhelmus J.: *See—*
Hendriksma, Roelof R.; and VanRhijn, Wilhelmus J., 4,345,015, Cl. 430-137.000.

Vaponics, Inc.: *See—*
Smith, Verity C., 4,344,826, Cl. 203-2.000.

Varjas, Laszlo: *See—*
Novak, Lajos; Szantay, Csaba; Rohaly, Janos; Kis-Tamas, Attila; Varjas, Laszlo; and Csutak, Janos, 4,344,959, Cl. 424-279.000.

Varlonga, Giovanni, to Feal S.p.A. Thermally insulated aluminum door or window frame. 4,344,254, Cl. 49-401.000.

Varma, Ravi K.: *See—*
Bernstein, Jack; Varma, Ravi K.; Vogt, B. Richard; and Weisenborn, Frank L., 4,345,096, Cl. 562-465.000.

Vasipari Kutato Intezet: *See—*
Kovacs, Sandor, 4,344,495, Cl. 177-211.000.

VEB Werk fur Fernsehelektronik Berlin im VEB Kombinat Mikroelektronik: *See—*
Demus, Dietrich; Zaschke, Horst; Vorbrodt, Hans-Mathias; Kresse, Horst; and Weissflog, Wolfgang, 4,344,856, Cl. 252-299.610.

Veith, Gustav G., to Gustav Georg Veith GmbH & Co., KG,; and Veith Transpo GmbH. Conveyor apparatus, particularly for overhead conveyance. 4,344,363, Cl. 104-162.000.

Veith Transpo GmbH: *See—*
Veith, Gustav G., 4,344,363, Cl. 104-162.000.

Vella, Louis C.; and Hansen, Walter I., to Eltra Corporation. Method and apparatus for arranging segmented character groups in a digital typesetter. 4,345,245, Cl. 340-744.000.

Venture Chemicals, Inc.: *See—*
Cowan, Jack C.; and Thrash, Tommy, 4,345,039, Cl. 521-48.000.

Verboom, Pieter, to IHC Holland N.V. Dragging type head for a suction dredger. 4,344,239, Cl. 37-66.000.

Verenigte Flugtechnische Werke GmbH: *See—*
Lerche, Ernst; Raschke, Bernward; and Hartwig, Siegfried, 4,345,237, Cl. 340-27.00R.

Veres, Imre. Sealingly mounting arrangement for propeller shafts of watercraft. 4,344,630, Cl. 277-4.000.

Vermeiren, Karel N.; Heemskerk, Rutgerus S.; and Dolfsma, Hendrik, to SKF Industrial Trading & Development Company, B.V. Device for measuring the lubrication of surfaces rolling or sliding relative to each other and lubricated with a lubricant. 4,345,203, Cl. 324-61.00R.

Vertac Chemical Corporation: *See—*
Howard, Kenneth J.; and Sidwell, Albert E., 4,345,097, Cl. 562-472.000.

Vesuvius International Corporation: *See—*
Szadkowski, Stanislav, 4,344,550, Cl. 222-600.000.

Viale, Ernesto: *See—*
Gandini, Marco; and Viale, Ernesto, 4,345,325, Cl. 370-29.000.

Vick, Steven C.; and Kanner, Bernard, to Union Carbide Corporation. Preparation of alkoxyaminohydridosilanes. 4,345,088, Cl. 556-410.000.

Victor United, Inc.: *See—*
Curran, Roger J., 4,344,410, Cl. 124-80.000.

Viehrig, Wolfgang; Osegowitsch, Viktor; and Hammer, Thomas, to Agfa-Gevaert Aktiengesellschaft. Arrangement for treating photographic bands running in parallel paths. 4,344,690, Cl. 354-319.000.

Visa, Heikki; and Laitinen, Heikki, to Oy Partek AB. Equipment for raising an exchange platform or container to a horizontal position above the level of the transport position. 4,344,731, Cl. 414-471.000.

Vishe, Richard A.: *See—*
Perisastry, Ayyala; Vishe, Richard A.; and Hoet, Peter J., 4,344,528, Cl. 206-3.000.

Visu-Flex Corporation: *See—*
Spees, Arthur T., 4,344,242, Cl. 40-373.000.

Voest-Alpine Aktiengesellschaft: *See—*
Suessenbeck, Heinrich; Siebenhofer, Gottfried; Neuper, Rienhard; and Zitz, Alfred, 4,344,354, Cl. 91-168.000.

Voetz, Franz J., to Hoechst Aktiengesellschaft. Shaped articles made from expanded minerals. 4,344,797, Cl. 106-84.000.

Vogt, B. Richard: *See—*
Bernstein, Jack; Varma, Ravi K.; Vogt, B. Richard; and Weisenborn, Frank L., 4,345,096, Cl. 562-465.000.

Vogt, Robert K.; and Heit, Martin A., to E. W. Buschman Company, The. Roller conveyor with friction roll drive. 4,344,527, Cl. 198-781.000.

Voith Fischer Kunststofftechnik GmbH & Co. KG: *See—*
Fritz, Hans-Gerhard; and Scharrenbroich, Helmut, 4,344,749, Cl. 425-174.400.

Volkswagenwerk Aktiengesellschaft: *See—*
Geiger, Istvan; and Theuerkauf, Heinz, 4,344,397, Cl. 123-339.000.

Vorbrodt, Hans-Mathias: *See—*
Demus, Dietrich; Zaschke, Horst; Vorbrodt, Hans-Mathias; Kresse, Horst; and Weissflog, Wolfgang, 4,344,856, Cl. 252-299.610.

Voss, Richard J., to General Motors Corporation. Generator voltage regulator. 4,345,199, Cl. 322-28.000.

W. L. Gore & Associates, Inc.: *See—*
Gohlke, Daniel J., 4,344,999, Cl. 428-212.000.

W. Schlafhorst & Co.: *See—*
Rohner, Joachim; Zumfeld, Heinz; and Mauries, Reinhard, 4,344,277, Cl. 57-22.000.

Wacker-Chemie GmbH: *See—*
Thyret, Helmut E.; Balwe, Thomas; Beier, Gerhard; and Bauer, Johann, 4,345,056, Cl. 526-200.000.

Wadland, Mary J. Board game for forming alphabetic symbols. 4,344,626, Cl. 273-243.000.

Wagner, Kuno: *See—*
Schafer, Walter; Wagner, Kuno; and Block, Hans-Dieter, 4,344,855, Cl. 252-182.000.

Wagner, Kurt J. Chin implant. 4,344,191, Cl. 3-1.900.

Wakamatsu, Atsuyuki; and Tonooka, Keisuke, to Daiwa Can Company. Bag slitting apparatus. 4,344,268, Cl. 53-384.000.

Walden, John: *See—*
Pinsky, Michael L.; and Walden, John, 4,344,650, Cl. 299-4.000.

Waldhecker, Heinz-Dieter: *See—*
Paschen, Peter; Pfeiffer, Roland; Waldhecker, Heinz-Dieter; Kryczun, Alfred; and Pufal, Rolf, 4,344,773, Cl. 48-92.000.

Walker, James R.: *See—*
Grant, Duane E.; and Walker, James R., 4,344,691, Cl. 355-1.000.

Walker, Michael J., to Lucas Industries Limited. Missing pulse detector. 4,345,209, Cl. 328-120.000.

Walkup, William B., to Ark-Les Corporation. Wide compliance insulation displacement terminal block. 4,344,664, Cl. 339-99.00R.

Walls, Lester L., Jr.: *See—*
Weisner, Kent A.; and Walls, Lester L., Jr., 4,344,261, Cl. 52-200.000.

Walter, John, to Continental Group, Inc., The. Adhesive composition. 4,345,047, Cl. 525-108.000.

Walter, John: *See—*
Aschberger, Anton A.; and Walter, John, 4,344,545, Cl. 220-307.000.

Walters, William R. Icing preventor. 4,344,450, Cl. 137-62.000.

Wang, Taylor G.: *See—*
United States of America, National Aeronautics and Space Administration; Wang, Taylor G.; and Elleman, Daniel D., 4,344,787, Cl. 65-21.400.

Warde, Suzanne M. Artificial flower making template and method. 4,344,805, Cl. 156-61.000.

Warehime, Norwood R. Turnstile goal and games usage. 4,344,628, Cl. 273-388.000.

Warncke, Heinz: *See—*
Haupt, Walter; Warncke, Heinz; Friebe, Heinz W.; and Reimold, Dieter, 4,344,320, Cl. 73-40.700.

Warner-Lambert Company: *See—*
Chen, Evan N.; Emmett, James S.; Ferraro, Frank A.; and Peleckis, Anthony J., 4,344,227, Cl. 30-41.000.
Hoefle, Milton L.; and Klutchko, Sylvester, 4,344,949, Cl. 424-258.000.

Warner, Norman S. Energy converter machine. 4,344,286, Cl. 60-531.000.

Warnier, Jean M. M.: *See—*
Bour, Edmond H. J. P.; Brouwers, Johannes A. L.; and Warnier, Jean M. M., 4,345,065, Cl. 528-312.000.

Watanabe, Hiroshi: *See—*
Kobayashi, Satoru; and Watanabe, Hiroshi, 4,345,172, Cl. 307-562.000.

Watanabe, Kazuo: *See—*
Hanyu, Susumu; Tonomura, Yoshinobu; and Watanabe, Kazuo, 4,345,196, Cl. 318-812.000.

Watanabe, Keiji: *See—*
Saito, Masato; Tsuchihashi, Michihiro; Takai, Yoshinori; Fukuyama, Keiji; and Watanabe, Keiji, 4,345,186, Cl. 315-49.000.

Watanabe, Seiichi: *See—*
Kunitake, Tatsuro; Ohtani, Hiroo; Watanabe, Seiichi; Takigawa, Toshiji; and Matsumoto, Yoshiro, 4,344,801, Cl. 148-3.000.

Watanabe, Susumu: *See—*
Sakakibara, Hideo; Fujiwara, Tatsuro; Okegawa, Osamu; Honda, Eiichi; Watanabe, Susumu; and Matsuda, Tetsuo, 4,345,069, Cl. 536-7.100.

Waters, E. Eugene; and Harrell, Gordon E. Insulation cap for disappearing stairwells. 4,344,505, Cl. 182-47.000.

Watkins, Neil A.; and Richardson, Clayton H., Jr., to Gulf States Manufacturers, Inc. Solar heating panel for metal buildings. 4,344,413, Cl. 126-429.000.

Watkins, Thomas I.: *See—*
Copping, Leonard G.; Kerry, John C.; Watkins, Thomas I.; Willis, Robert J.; and Palmer, Bryan H., 4,344,893, Cl. 260-456.00A.

Wavin B.V.: *See—*
Beune, Joannes H.; and Marissen, Roelof H., 4,344,461, Cl. 138-109.000.

Wavre, Alain: *See—*
Semon, Georges; and Wavre, Alain, 4,345,131, Cl. 219-69.00G.

Waybright, George C., to RCA Corporation. High voltage protection circuit for a television receiver. 4,345,275, Cl. 358-243.000.

Wayland, Paul O.: *See—*
Cherry, Sidney J.; and Wayland, Paul O., 4,345,126, Cl. 200-144.00B.

Webb, John A.: *See—*
Thompson, Brett A.; Webb, John A.; and White, Martin B., 4,345,201, Cl. 324-52.000.

Weber, Charles T. Apparatus for the generation of gaseous fuel. 4,344,831, Cl. 204-228.000.

Weber, Robert N.: *See—*
Racilla, John J.; and Weber, Robert N., 4,344,665, Cl. 339-99.00R.

Weir, Richard L. Signalling device for use in automotive and like vehicles. 4,345,238, Cl. 340-52.00R.

Weisenborn, Frank L.: *See—*
Bernstein, Jack; Varma, Ravi K.; Vogt, B. Richard; and Weisenborn, Frank L., 4,345,096, Cl. 562-465.000.

Weisner, Kent A.; and Walls, Lester L., Jr., to Kennedy Sky-Lites, Inc. Skylight. 4,344,261, Cl. 52-200.000.

Weiss, Donald C.: *See—*
Begeman, Robert H.; Sanderson, Barry D.; Weiss, Donald C.; and Zeph, David L., 4,345,251, Cl. 340-825.860.

Weissflog, Wolfgang: *See—*
Demus, Dietrich; Zaschke, Horst; Vorbrodt, Hans-Mathias; Kresse, Horst; and Weissflog, Wolfgang, 4,344,856, Cl. 252-299.610.

Welton, Roy E. Short haul tow bar. 4,344,635, Cl. 280-414.100.

Wensink, Ben L. Jet etch apparatus for decapsulation of molded devices. 4,344,809, Cl. 156-345.000.

West Point Foundry & Machine Co.: *See—*
Christian, Charlie R.; Gaskins, Jack C.; Hamrick, Jack; and Reed, Norman L., 4,344,211, Cl. 28-183.000.

Western Electric Company, Inc.: *See—*
Bulger, Gary A.; Heck, Lyle D.; Huttemann, Robert D.; Morabito, Joseph M.; Pitetti, Raymond C.; Unger, Burton A.; and Vallere, Donald J., 4,344,223, Cl. 29-577.00C.
Colwell, Darrel R., 4,344,825, Cl. 203-1.000.
Kahn, Sherwin R., 4,344,326, Cl. 73-587.000.
Radke, Leo L., 4,345,165, Cl. 307-265.000.

Westinghouse Electric Corp.: *See—*
Cherry, Sidney J.; ar.1 Wayland, Paul O., 4,345,126, Cl. 200-144.00B.
DeLaurentis, Angelo A., 4,345,232, Cl. 336-210.000.

Wheadon, Ellis G.; and Nowakowski, Robert J., to General Motors Corporation. Vehicle battery charging system. 4,345,197, Cl. 320-6.000.

Whirlpool Corporation: *See—*
Linstromberg, William J., 4,344,295, Cl. 62-155.000.

White, David R., to Upjohn Company, The. Intermediate compounds in the preparation of spectinomycin. 4,344,882, Cl. 549-387.000.

White, David R., to Upjohn Company, The. Intermediate compounds in the preparation of spectinomycin. 4,345,086, Cl. 549-16.000.

White, Gary D., to Sperry Corporation. ECC Check bit generation using through checking parity bits. 4,345,328, Cl. 371-38.000.

White, Gary R.: *See—*
Aldrich, Roger B.; and White, Gary R., 4,344,314, Cl. 72-461.000.

White, James M.: *See—*
Melamud, Robert C.; Nihart, James D.; and White, James M., 4,345,314, Cl. 364-515.000.

White, Lawrence J., to Raychem Corporation. Internal pipe line delivery device. 4,344,214, Cl. 29-252.000.

White, Martin B.: *See—*
Thompson, Brett A.; Webb, John A.; and White, Martin B., 4,345,201, Cl. 324-52.000.

Whitney, Colin G.: *See—*
Pines, Michael Y.; Whitney, Colin G.; and Duncan, James S., 4,345,148, Cl. 250-214.00C.

Wick, Gerhard, to Akzo NV. Potting medium from polyurethanes. 4,344,873, Cl. 528-58.000.

Widder, Rudi; Getto, Elmar; and Hettche, Albert, to BASF Aktiengesellschaft. Reaction products of sulfonamido-carboxylic acids or carboxamido-carboxylic acids with alkanolamines, and their use as low-foaming corrosion inhibitors. 4,344,862, Cl. 252-391.000.

Widham, Ernest G. Signal devices for rural mailboxes. 4,344,559, Cl. 232-35.000.

Wiechert, Rudolf; Bittler, Dieter; Schleusener, Annerose; and Albring, Manfred, to Schering Aktiengesellschaft (A.G.). Antiandrogenic 17α-substituted steroids. 4,344,941, Cl. 424-243.000.

Wielhouwer, John D.: *See—*
Wielhouwer, Sandra L.; and Fortner, Suzanne M., 4,344,758, Cl. 433-137.000.

Wielhouwer, Sandra L.; and Fortner, Suzanne M., to Wielhouwer, John D. Dental face shield. 4,344,758, Cl. 433-137.000.

Wienecke, Horst, to Richardson GmbH. Herbal center drop and process for its preparation. 4,344,972, Cl. 426-103.000.

Wiesinger, Johannes: *See—*
Hasse, Peter; Wiesinger, Johannes; and Pivit, Erich, 4,345,293, Cl. 361-117.000.
Hasse, Peter; Wiesinger, Johannes; and Pivit, Erich, 4,345,295, Cl. 361-130.000.

Wilda, Douglas W.: *See—*
Green, Norman F.; and Wilda, Douglas W., 4,344,632, Cl. 277-152.000.

Wiley, Richard H. 4-Amino-6-(2'-carboxyethyl)-3-methylthio-1,2,4-triazin-5(4H)-one. 4,345,075, Cl. 544-182.000.

Wilharm, Fred B.: *See—*
Newton, Donald O.; and Wilharm, Fred B., 4,344,558, Cl. 229-62.500.

Wilkes, Robert J.: *See—*
Bleiweiss, Arthur F.; Cotoara, Dimitru; and Wilkes, Robert J., 4,344,672, Cl. 350-288.000.

Wilkinson, Richard L., to Discovision Associates. Dielectric recording medium. 4,345,261, Cl. 346-76.00L.

Williams, George J.: *See—*
Boyer, Robert C.; and Williams, George J., 4,344,480, Cl. 165-162.000.

Williams, Leo M., Jr.; and Dunkle, Steven L. Hydraulic/pneumatic suspension system for snowmobiles. 4,344,637, Cl. 280-21.00R.

Williamson, Willie, to Rolls-Royce Limited. Sealing device. 4,344,736, Cl. 415-14.000.

Willington, John M., to A.P.M. Wood Products Pty. Ltd. Wood drying kiln. 4,344,237, Cl. 34-191.000.

Willis, Robert J.: *See—*
Copping, Leonard G.; Kerry, John C.; Watkins, Thomas I.; Willis, Robert J.; and Palmer, Bryan H., 4,344,893, Cl. 260-456.00A.

Wilson, Paul S. Anti-falsing and zero nulling search head for a metal detector. 4,345,208, Cl. 324-329.000.

Wilwardco, Inc.: *See—*
Capener, Erwin L.; and Low, James M., 4,344,770, Cl. 44-50.000.

Winn, Leo W., to Mechanical Technology Incorporated. Pressure insensitive lip seal. 4,344,631, Cl. 277-29.000.

Woditsch, Peter: *See—*
Kohler, Klaus; Woditsch, Peter; Rieck, Hilmar; and Rodi, Fritz, 4,344,799, Cl. 106-300.000.

Wojcichowski, Lothar: *See—*
Fink, Lothar; and Wojcichowski, Lothar, 4,344,601, Cl. 249-167.000.

Wojnarowski, Robert J.: *See—*
Eichelberger, Charles W.; and Wojnarowski, Robert J., 4,345,236, Cl. 338-176.000.

Wolfberg, Robert, to Signode Corporation. Self-cycling pneumatic fastener applying tool. 4,344,555, Cl. 227-130.000.

Wolfinger, John F., to General Electric Company. Generator air gap electrical torque monitor. 4,345,198, Cl. 322-25.000.

Wollam, Carl A.; Gailey, J. Lynn; and Chalmers, Alexander A., to Alcan Aluminum Corporation. Process and apparatus for coating strip articles and the like. 4,344,990, Cl. 427-286.000.

Wong, Patrick S.: *See—*
Bonsen, Pieter; Wong, Patrick S.; and Theeuwes, Felix, 4,344,929, Cl. 424-15.000.

Woo, Ji Y., to Bendix Corporation, The. Duo servo drum brake and parking mechanism therefor. 4,344,512, Cl. 188-79.5GE.

Woodcock, Sydney H.: *See—*
Yates, Patrick; Woodcock, Sydney H.; and Beals, Jeffrey R., 4,344,352, Cl. 89-198.000.

Woods, Melvin E.: *See—*
Heydrich, Hans; Woods, Melvin E.; and Geary, William C., 4,344,390, Cl. 123-41.82A.

Woodstream Corporation: *See—*
Michel, John M., 4,344,646, Cl. 292-87.000.

Wooff, Edward A., Jr., to Circon Corporation. Integrated beam splitter and adjustable light intensity control adapter. 4,344,667, Cl. 350-80.000.

Wovcha, Merle G.; and Biggs, Candice B., to Upjohn Company, The. *Mycobacterium phlei* mutants convert sterols to androsta-1,4-diene-3,17-dione and androsta-4-ene-3,17-dione. 4,345,029, Cl. 435-55.000.

Wovcha, Merle G.; and Biggs, Candice B., to Upjohn Company, The. Microorganism mutant conversion of sterols to androsta-4-ene-3,17-dione. 4,345,030, Cl. 435-55.000.

Wovcha, Merle G.; Biggs, Candice B.; and Pyke, Thomas R., to Upjohn Company, The. *Mycobacterium fortuitum* mutant. 4,345,033, Cl. 435-253.000.

Wovcha, Merle G.; and Brooks, Kevin E., to Upjohn Company, The. *Mycobacterium fortuitum* mutant. 4,345,034, Cl. 435-253.000.

Wright, Darrell L.: *See—*
Casterton, Robert H.; Phippen, Larry J.; and Wright, Darrell L., 4,344,356, Cl. 98-2.110.

Wright, David B.; Moore, Sanders H.; and Kircher, Morton S., to Olin Corporation. Restrictor apparatus for electrolyte flow conduit. 4,344,833, Cl. 204-258.000.

Wright, Franklin J.: *See—*
McCandlish, Larry E.; Wright, Franklin J.; and Kugler, Edwin L., 4,345,038, Cl. 518-711.000.

Wright Line Inc.: *See—*
Latino, Richard M.; and Paquette, Edmund T., 4,344,205, Cl. 16-2.000.

Wright, William B., Jr.: *See—*
Tomcufcik, Andrew S.; Wright, William B., Jr.; and Marsico, Joseph W., Jr., 4,344,954, Cl. 424-270.000.

Wronka, Bodo, to Mannesmann DeMag AG. Cover for vessel for a metal melting furnace, in particular an electric arc furnace. 4,345,332, Cl. 373-74.000.

Wunder, Richard H., to Polysar Limited. Emulsion polymer recovery. 4,345,067, Cl. 528-485.000.

Wyckoff, Charles W., to Academy of Applied Science, Inc., The. Process for increasing the effective speed of photographic films and improved film structures. 4,345,023, Cl. 430-364.000.

Xerox Corporation: *See—*
Cross, Thomas R., 4,344,554, Cl. 227-30.000.
Hamaker, Ralph A., 4,344,693, Cl. 355-3.0BE.
Knox, Keith T., 4,345,313, Cl. 364-515.000.

Xertex Corporation: *See—*
Takahashi, Yoshihiro, 4,344,918, Cl. 422-80.000.

Yagi, Michio; and Sawano, Hiroshi, to Konishiroku Photo Industry Co., Ltd. Camera with photoelectric focus detecting device. 4,344,679, Cl. 354-25.000.

Yagihara, Morio; and Yokota, Yukio, to Fuji Photo Film Co., Ltd. Color photographic silver halide light-sensitive material. 4,345,025, Cl. 430-385.000.

Yamabe, Masaaki; Kojima, Gen; and Kaya, Seitoku, to Asahi Glass Company, Ltd. Curable fluorocopolymer. 4,345,057, Cl. 526-247.000.

Yamada, Koichi; and Shinya, Yasuo, to Sumitomo Aluminium Smelting Co., Ltd. Sintering method of zirconia. 4,344,904, Cl. 264-66.000.

Yamada, Matsuichi: *See—*
Komuro, Keigo; Yamada, Matsuichi; Aoki, Katsuhiko; Yoshikawa, Yoshihiko; Itoh, Fumio; Takeda, Fumio; and Ishida, Osami, 4,345,255, Cl. 343-100.0PE.

Yamada, Minoru, to Yamaha Hatsudoki Kabushiki Kaisha. Induction system of multi-cylinder engine. 4,344,396, Cl. 123-337.000.

Yamada, Sachiko: *See—*
Takayama, Hiroaki; Yamada, Sachiko; and Ohmori, Masayuki, 4,344,888, Cl. 260-397.200.

Yamada, Seiji, to Minolta Camera Kabushiki Kaisha. Selection and setting device for camera exposure control. 4,344,681, Cl. 354-38.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Mizutani, Masashi; and Nakamura, Shiro, 4,344,391, Cl. 123-146.50A.
Yamada, Minoru, 4,344,396, Cl. 123-337.000.

Yamamoto, Kuniyuki: *See—*
Kurata, Noboru; Miyazaki, Kunio; and Yamamoto, Kuniyuki, 4,344,500, Cl. 180-230.000.

Yamamoto, Michio: *See—*
Nagura, Kenji; Takeda, Shinichi; Namie, Koshi; Fujii, Takao; Yamamoto, Michio; and Yokoyama, Seiichi, 4,345,089, Cl. 560-77.000.

Yamamoto, Shinji: *See—*
Ishikawa, Isao; Kanda, Hiroshi; and Yamamoto, Shinji, 4,345,156, Cl. 250-385.000.

Yamanishi, Toru: *See—*
Uchida, Naoya; Yoshida, Masaaki; and Yamanishi, Toru, 4,344,669, Cl. 350-96.300.

Yamasa Shoyu Kabushiki Kaisha: *See—*
Machida, Haruhiko, 4,344,937, Cl. 424-180.000.

Yamato Scale Co. Ltd.: *See—*
Hirano, Takashi, 4,344,492, Cl. 177-25.000.

Yamazoe, Hisamitsu: *See—*
Matsumura, Toshimi; Omori, Norio; and Yamazoe, Hisamitsu, 4,344,399, Cl. 123-339.000.

Yanmar Diesel Engine Co., Ltd.: *See—*
Nagasaki, Michisuke; and Aso, Kinichi, 4,344,337, Cl. 74-740.000.

Yao, Shi-Kay, to Rockwell International Corporation. Optical signal processing device. 4,344,675, Cl. 350-358.000.

Yarp, Russel E.: *See—*
Van Horne, Arthur C.; and Yarp, Russel E., 4,344,715, Cl. 400-616.100.

Yasuye, Toshikazu; Kashioka, Seiji; and Shima, Yoshihiro, to Hitachi, Ltd. Method and device for inspecting the defect of a pattern represented on an article. 4,345,312, Cl. 364-515.000.

Yates, Patrick; Woodcock, Sydney H.; and Beals, Jeffrey R. Semi-automatic firearm. 4,344,352, Cl. 89-198.000.

Yavnieli, Mordechai, to AMCOR Ltd. Electrostatic air filter. 4,344,776, Cl. 55-129.000.

Yazidjian, Jean-Claude, to Framatome. Device for separating water from steam at the vaporization vessel outlet of a steam generator. 4,344,387, Cl. 122-34.000.

Yin, Lo I., to United States of America, National Aeronautics and Space Administration. Low intensity X-ray and gamma-ray spectrometer. 4,345,153, Cl. 250-369.000.

Yoder, Max N., to United States of America, Navy. Superior ohmic contacts to III–V semiconductor by virtue of double donor impurity. 4,344,980, Cl. 427-38.000.

Yokogawa Electric Works, Ltd.: *See—*
Tamura, Hisashi; Taniguchi, Naozo; and Ishikawa, Hirotoshi, 4,345,150, Cl. 250-339.000.

Yokota, Yukio: *See—*
Yagihara, Morio; and Yokota, Yukio, 4,345,025, Cl. 430-385.000.

Yokoyama, Kimio: *See—*
Shimada, Shoji; Sonoda, Sakae; and Yokoyama, Kimio, 4,344,308, Cl. 72-39.000.

Yokoyama, Seiichi: *See—*
Nagura, Kenji; Takeda, Shinichi; Namie, Koshi; Fujii, Takao; Yamamoto, Michio; and Yokoyama, Seiichi, 4,345,089, Cl. 560-77.000.

Yolles, Seymour, to University of Delaware. Polymeric article for dispensing drugs. 4,344,431, Cl. 128-260.000.

Yoneda, Yasuhiro; Kitakohji, Toshisuke; and Kitamura, Kenro, to Fujitsu Limited. Positive resist polymer composition and method of forming resist pattern. 4,345,020, Cl. 430-270.000.

Yonekura, Seiji: *See—*
Suzuki, Mitsuo; Tokunaga, Takeshi; Yonekura, Seiji; Matsuoka, Shigeru; and Nakamura, Kenji, 4,344,252, Cl. 49-199.000.

Yoshida, Kazunori: *See—*
Hasegawa, Junzo; Kawabata, Susumu; Yoshida, Kazunori; Suzuki, Fuzio; Itoh, Yusuke; Suzuki, Hajime; Arakawa, Hiroshi; and Kobayashi, Akira, 4,344,465, Cl. 139-435.000.

Yoshida, Kiyoshi: *See—*
Nakada, Akira; Sugiura, Toshio; Okamoto, Eisaku; and Yoshida, Kiyoshi, 4,344,344, Cl. 84-1.030.

Yoshida, Kooichi: *See—*
Aoda, Yukio; Ninomiya, Hiroshi; Yoshida, Kooichi; and Koyanagi, Osamu, 4,344,968, Cl. 424-365.000.

Yoshida, Masaaki: *See—*
Uchida, Naoya; Yoshida, Masaaki; and Yamanishi, Toru, 4,344,669, Cl. 350-96.300.

Yoshida, Masashi: *See—*
Miyakawa, Seii; Kawauchi, Akira; Iijima, Kazunori; Terayama, Takao; Yoshida, Masashi; and Kawase, Hideyuki, 4,345,282, Cl. 360-85.000.

Yoshida, Tsuyoshi: *See—*
Amano, Hiroyuki; Yoshida, Tsuyoshi; and Shibata, Kazuhiko, 4,345,240, Cl. 340-345.000.

Yoshikawa, Yoshihiko: *See—*
Komuro, Keigo; Yamada, Matsuichi; Aoki, Katsuhiko; Yoshikawa, Yoshihiko; Itoh, Fumio; Takeda, Fumio; and Ishida, Osami, 4,345,255, Cl. 343-100.0PE.

Yoshikawa, Yoshihiro; Katabami, Takao; Fujinaga, Katsumi; and Kobayashi, Yoshiaki, to Aloka Co., Ltd. Electronic scanning ultrasonic diagnostic system. 4,344,327, Cl. 73-626.000.

Yoshimi, Akiro: *See—*
Kojima, Yasuhumi; Saito, Atsunori; and Yoshimi, Akiro, 4,344,565, Cl. 236-46.00R.

Yoshino, Hisashi: *See—*
Okutomi, Tsutomu; Iida, Masachika; Kuwabara, Kazuyoshi; Yoshino, Hisashi; and Takayanagi, Eiichi, 4,345,130, Cl. 200-268.000.

Young, Dean A. Method of preparing crystalline silica polymorph. 4,344,927, Cl. 423-339.000.

Young, Donald C.; and Green, James A., II, to Union Oil Company of California. Method of selectively removing biuret from urea and compositions for use therein. 4,345,099, Cl. 564-63.000.

Youngfleish, Frank C.: *See—*
Corman, Ned E.; Kandybowski, Steven J.; Scheingold, William S.; and Youngfleish, Frank C., 4,345,267, Cl. 357-81.000.

Youngquist, Rudolph W.; and Brabbs, William J., to Procter & Gamble Company, The. Single-dough cookies having storage stable texture. 4,344,969, Cl. 426-18.000.

Youngstown Steel Door Company, The: *See—*
Fritz, William E.; and Soddy, Thomas C., 4,344,365, Cl. 105-282.00A.
Madland, Thorvald, 4,344,366, Cl. 105-378.000.

Yue, Alfred S.: *See—*
Parsons, James D.; and Yue, Alfred S., 4,345,177, Cl. 313-95.000.

Yusa, Haruhiko; Oota, Masanori; and Isaka, Haruki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Vinyl chloride resin composition. 4,345,043, Cl. 523-209.000.

Yuyama, Masahiro: *See—*
Kitagawa, Yoshihiko; Yuyama, Masahiro; Moritani, Masahiko; and Suzuki, Mikio, 4,344,906, Cl. 264-128.000.

Zabec, Glenn M.: *See—*
Penney, C. Bradford; Zabec, Glenn M.; and Sridharan, Sri P., 4,345,304, Cl. 362-183.000.

Zacharias, Karl: *See—*
Grote, Hugo; Hasselmann, Heinz; Kunze, Volkmar; Zacharias, Karl; Kuelpmann, Robert; and Mueller, Paul, 4,344,515, Cl. 192-67.00R.

Zaharis, Edward J. Internal combustion engine. 4,344,405, Cl. 123-568.000.

Zahid, Abduz, to Greer Hydraulics, Incorporated. Accumulator device with improved bladder seal. 4,344,458, Cl. 138-30.000.

Zahnraderfabrik Renk A.G.: *See—*
Mayr, Erwin, 4,344,608, Cl. 266-245.000.

Zahnradfabrik Friedrichshafen, AG.: *See—*
Lang, Armin, 4,344,284, Cl. 60-433.000.
Liebert, Karl-Heinz; Tischer, Werner; and Deppenbrock, Christoph, 4,344,283, Cl. 60-384.000.
Merz, Johann, 4,344,717, Cl. 403-14.000.

Zall, Robert R.; and Dzurec, David J., to Cornell Research Foundation, Inc. Stabilization of milk and improved cheese yields. 4,344,970, Cl. 426-40.000.

Zammert, Wolf U., to Karl Schmidt GmbH. Process of shaping the rim of a combustion chamber recess of a light-alloy piston. 4,345,138, Cl. 219-121.0LF.

Zaschke, Horst: *See—*
Demus, Dietrich; Zaschke, Horst; Vorbrodt, Hans-Mathias; Kresse, Horst; and Weissflog, Wolfgang, 4,344,856, Cl. 252-299.610.

Zeman, Robert E., to Eastman Kodak Company. Electrophotographic apparatus having improved grounding means. 4,344,698, Cl. 355-16.000.

Zenith Stairways & Building Products, Inc.: *See—*
Basey, Gene, 4,344,604, Cl. 256-65.000.

Zeph, David L.: *See—*
Begeman, Robert H.; Sanderson, Barry D.; Weiss, Donald C.; and Zeph, David L., 4,345,251, Cl. 340-825.860.

Zeuna-Staerker KG: *See—*
Santiago, Andres; and Santiago, Enrique, 4,344,921, Cl. 422-179.000.
Santiago, Andres; and Santiago, Enrique, 4,344,922, Cl. 422-179.000.

Zielinski, Paul A.: *See—*
Kim, Chang Kyu; Maggiulli, Cataldo A.; and Zielinski, Paul A., 4,345,085, Cl. 548-360.000.

Zitz, Alfred: *See—*
Suessenbeck, Heinrich; Siebenhofer, Gottfried; Neuper, Rienhard; and Zitz, Alfred, 4,344,354, Cl. 91-168.000.

Ziv, Avraham: *See—*
Hollowell, William; Tanaka, Akira; Ziv, Avraham; and Stamboulian, Nazareth, 4,344,588, Cl. 242-107.40A.

Ziv, Martin H.: *See—*
Hyman, Floyd L.; and Ziv, Martin H., 4,345,079, Cl. 544-351.000.

Zolnerovich, Walter, Jr.: *See—*
Rapp, Kenneth L.; and Zolnerovich, Walter, Jr., 4,344,582, Cl. 242-45.000.

Zoschak, Robert J., to Foster Wheeler Energy Corporation. Vapor generating system having integrally formed gasifiers extending to either side of the hopper portion of the generator. 4,344,371, Cl. 110-229.000.

Zucker, Newton; and Ellslager, William M., to Kalcor Coatings Company, Inc. Anti-foaming compositions. 4,344,858, Cl. 252-358.000.

Zumfeld, Heinz: *See—*
Rohner, Joachim; Zumfeld, Heinz; and Mauries, Reinhard, 4,344,277, Cl. 57-22.000.

Zumsteg, Alphonse, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Temperature compensated signal generator including two crystal oscillators. 4,345,221, Cl. 331-176.000.

Zunino, Patrick: *See—*
Cazarra, Victor; Schwab, Andre; and Zunino, Patrick, 4,344,815, Cl. 156-601.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF AUGUST, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Air Products and Chemicals, Inc.: *See*—
Sircar, Shivaji, Re. 31,014, Cl. 55-26.000.

Allen, John D. Fitment for a vessel. Re. 31,012, Cl. 285-114.000.

Belke, Jack T., to Westran Corporation. Landing gear construction. Re. 31,011, Cl. 280-763.000.

Gulf & Western Manufacturing Company: *See*—
Smith, Joseph E., Jr., Re. 31,013, Cl. 403-27.000.

Sircar, Shivaji, to Air Products and Chemicals, Inc. Separation of multicomponent gas mixtures. Re. 31,014, Cl. 55-26.000.

Smith, Joseph E., Jr., to Gulf & Western Manufacturing Company. Calibrated replacement torque rod. Re. 31,013, Cl. 403-27.000.

Westran Corporation: *See*—
Belke, Jack T., Re. 31,011, Cl. 280-763.000.

LIST OF DESIGN PATENTEES

Aero Systems Research, Inc.: *See*—
Buck, Gaylord B., 265,801, Cl. D10-96.000.

Agfa-Gevaert AG: *See*—
Schultes, Herbert; and Rubner, Karl-Heinz, 265,831, Cl. D16-42.000.

Aggressive Industries, Inc.: *See*—
Berquist, DeWayne D., 265,787, Cl. D6-196.000.

Ahn, Chong T. Music box. 265,836, 8-17-82, Cl. D17-24.000.

Aiba, Nobushiro: *See*—
Kira, Yasuhiro; Watabiki, Yoshiro; Aiba, Nobushiro; and Koyama, Katsumi, 265,832, Cl. D17-5.000.

AMF Incorporated: *See*—
Hahn, Daniel G., 265,817, Cl. D12-179.000.

Angell, S. Ralph. Easel. 265,786, 8-17-82, Cl. D6-180.000.

Atwood, Robert G.: *See*—
Elzea, Lorene E.; and Atwood, Robert G., 265,777, Cl. D3-35.000.

Babbage, Thomas A., to Trianco Redfyre Limited. Facia for a domestic heating appliance. 265,851, 8-17-82, Cl. D23-128.000.

Barr, Josef J. Pearl necklace or similar article. 265,803, 8-17-82, Cl. D11-8.000.

Barr, Josef J. Pearl necklace or similar article. 265,804, 8-17-82, Cl. D11-8.000.

Barr, Josef J. Pearl necklace or similar article. 265,805, 8-17-82, Cl. D11-8.000.

Barr, Josef J. Pearl necklace or similar article. 265,806, 8-17-82, Cl. D11-8.000.

Barr, Josef J. Pearl necklace or similar article. 265,807, 8-17-82, Cl. D11-8.000.

Barr, Josef J. Finger ring or similar article. 265,808, 8-17-82, Cl. D11-26.000.

Barr, Josef J. Finger ring or similar article. 265,809, 8-17-82, Cl. D11-34.000.

Barr, Josef J. Finger ring or similar article. 265,810, 8-17-82, Cl. D11-34.000.

Barr, Josef J. Earring. 265,811, 8-17-82, Cl. D11-76.000.

Beach, Danny J.: *See*—
Keith, Keith S.; Hauser, Stephen G.; and Beach, Danny J., 265,795, Cl. D9-370.000.

Bell, Michael. Boot with angularly extending cleats. 265,776, 8-17-82, Cl. D2-274.000.

Berquist, DeWayne D., to Aggressive Industries, Inc. End support for a combined table and bench unit. 265,787, 8-17-82, Cl. D6-196.000.

Best Toys Co., Ltd., The: *See*—
Tung, Wai K., 265,843, Cl. D21-156.000.
Tung, Wai-Kuen, 265,841, Cl. D21-90.000.

Bleiweiss, Arthur F.: *See*—
Urbanek, Karel; and Bleiweiss, Arthur F., 265,855, Cl. D26-122.000.

Blinder, Roberto: *See*—
Jaffe, Harold; Blinder, Roberto; and Jaffe, Lowell J., 265,828, Cl. D15-144.000.

Bowing Enterprises: *See*—
Crumley, James H., 265,775, Cl. D2-29.000.

Bozley, Inc.: *See*—
Elzea, Lorene E.; and Atwood, Robert G., 265,777, Cl. D3-35.000.

Bradford, Arnie C. Heating stove. 265,850, 8-17-82, Cl. D23-97.000.

Braun Aktiengesellschaft: *See*—
Hartwein, Peter; and Schneider, Peter, 265,822, Cl. D14-34.000.
Hartwein, Peter, 265,823, Cl. D14-34.000.

Brentini, Attilio. Key holder. 265,778, 8-17-82, Cl. D3-61.000.

Brine, Peter J.: *See*—
Brine, WilliamH., Jr.; and Brine, Peter J., 265,845, Cl. D21-210.000.

Brine, WilliamH., Jr.; and Brine, Peter J., to W. H. Brine Company. Lacrosse stick head. 265,845, 8-17-82, Cl. D21-210.000.

Brion, Ennio, to Brionvega S.p.A. Color television receiver. 265,825, 8-17-82, Cl. D14-81.000.

Brionvega S.p.A.: *See*—
Brion, Ennio, 265,825, Cl. D14-81.000.

Brorsson, Jan-Erik. Ski and luggage carrier for vehicles. 265,814, 8-17-82, Cl. D12-157.000.

Buck, Gaylord B., to Aero Systems Research, Inc. Sensor for solar and wind energy monitor. 265,801, 8-17-82, Cl. D10-96.000.

Bunning, John G., to Esterline Angus Instrument Corporation. Disposable recording pen with ink reservoir. 265,838, 8-17-82, Cl. D19-41.000.

Burgoon, Jack L.; and Hayes, John M., to Scott & Fetzer Company, The; and Earl Grissmer Company, Inc. Carpet cleaning tool. 265,857, 8-17-82, Cl. D32-32.000.

Butera, Charles; and Butera, Ingela. Novelty thermoresponsive liquid crystal indicating device. 265,800, 8-17-82, Cl. D10-57.000.

Butera, Ingela: *See*—
Butera, Charles; and Butera, Ingela, 265,800, Cl. D10-57.000.

Camp International, Inc.: *See*—
Meloy, Dennis V., 265,853, Cl. D24-64.000.

Campos, Luis. Game board. 265,840, 8-17-82, Cl. D21-24.000.

Carver, Horace: *See*—
Owen, Newton C.; and Carver, Horace, 265,793, Cl. D9-341.000.

Conners, Michael; and Osborne, Thomas P., to CPG Products Corp. Animal push toy. 265,842, 8-17-82, Cl. D21-150.000.

CPG Products Corp.: *See*—
Conners, Michael; and Osborne, Thomas P., 265,842, Cl. D21-150.000.
Kite, Kenneth M.; and Moine, David W., 265,839, Cl. D21-13.000.

Crumley, James H., to Bowing Enterprises. Suit. 265,775, 8-17-82, Cl. D2-29.000.

Dainty, Robert J., Jr. Baby cradle. 265,781, 8-17-82, Cl. D6-15.000.

Denhoff, Donald P., to Sewell Plastics, Inc. Bottle. 265,796, 8-17-82, Cl. D9-378.000.

Dominion Auto Accessories Limited: *See*—
Urbanek, Karel; and Bleiweiss, Arthur F., 265,855, Cl. D26-122.000.

DSI-Sportartikel GmbH: *See*—
Scholz, Helmut, 265,846, Cl. D21-230.000.

Earl Grissmer Company, Inc.: *See*—
Burgoon, Jack L.; and Hayes, John M., 265,857, Cl. D32-32.000.

Elzea, Lorene E.; and Atwood, Robert G., to Bozley, Inc. Computer disc container. 265,777, 8-17-82, Cl. D3-35.000.

Esterline Angus Instrument Corporation: *See*—
Bunning, John G., 265,838, Cl. D19-41.000.

Fieni, Gabriel J. Shingle digger. 265,791, 8-17-82, Cl. D8-88.000.

Firestone Tire & Rubber Company, The: *See*—
Sladky, Donald J., 265,813, Cl. D12-152.000.

Foggia, Donald; and Pomponi, Roman, to TIE/Communications, Inc. Telephone key. 265,824, 8-17-82, Cl. D14-59.000.

Francis, John P. Van roof rack. 265,815, 8-17-82, Cl. D12-157.000.

Fusselman, Robert M., to GF Business Equipment, Inc. Desk. 265,783, 8-17-82, Cl. D6-162.000.

GF Business Equipment, Inc.: *See*—
Fusselman, Robert M., 265,783, Cl. D6-162.000.

Gross, William K. Combined post and mail box. 265,859, 8-17-82, Cl. D99-32.000.

Hahn, Daniel G., to AMF Incorporated. Design for a bicycle gear shifter. 265,817, 8-17-82, Cl. D12-179.000.

Harley Davidson Motor Co., Inc.: *See*—
Matre, Daniel A., 265,816, Cl. D12-174.000.

Hartwein, Peter; and Schneider, Peter, to Braun Aktiengesellschaft. Loudspeaker column. 265,822, 8-17-82, Cl. D14-34.000.

Hartwein, Peter, to Braun Aktiengesellschaft. Loudspeaker. 265,823, 8-17-82, Cl. D14-34.000.
Harvey, Thomas D.: *See—*
Winter, Russell K.; Savas, Nedim; Snively, Joseph H.; and Harvey, Thomas D., 265,792, Cl. D8-394.000.
Hauser, Stephen G.: *See—*
Keith, Keith S.; Hauser, Stephen G.; and Beach, Danny J., 265,795, Cl. D9-370.000.
Hayes, John M.: *See—*
Burgoon, Jack L.; and Hayes, John M., 265,857, Cl. D32-32.000.
Helfrich, Joseph, to Les Grands Chais deFrance. Bottle. 265,794, 8-17-82, Cl. D9-370.000.
Holmstadt, Ronald J.; Sorge, L. Ralph; and Tiedemann, Robert J., to Toro Company, The. Electric cultivator. 265,826, 8-17-82, Cl. D15-12.000.
Idropejo S.p.A.: *See—*
Ossola, Giuseppe, 265,798, Cl. D9-429.000.
Jaffe, Harold; Blinder, Roberto; and Jaffe, Lowell J., to Jaffe Manufacturing Company. Electroplater. 265,828, 8-17-82, Cl. D15-144.000.
Jaffe, Lowell J.: *See—*
Jaffe, Harold; Blinder, Roberto; and Jaffe, Lowell J., 265,828, Cl. D15-144.000.
Jaffe Manufacturing Company: *See—*
Jaffe, Harold; Blinder, Roberto; and Jaffe, Lowell J., 265,828, Cl. D15-144.000.
Johansson, Karl-Eric. Safety car seat for a child. 265,780, 8-17-82, Cl. D6-9.000.
Johansson, Tord G. I. High pressure cover. 265,848, 8-17-82, Cl. D23-1.000.
Johnson & Johnson Baby Products Company: *See—*
Simpson, Danny E.; and Williams, David M., 265,844, Cl. D21-204.000.
Kabushiki Kaisha Daini Seikosha: *See—*
Suzuki, Takao, 265,799, Cl. D10-39.000.
Kastan, B. Linn. Crank arm for a bicycle crank assembly. 265,812, 8-17-82, Cl. D12-123.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Tomonaga, Keisuke; Nishida, Hiroshi; and Miyazaki, Takeshi, 265,820, Cl. D12-307.000.
Keith, Keith S.; Hauser, Stephen G.; and Beach, Danny J., to United States Borax & Chemical Corporation. Bottle. 265,795, 8-17-82, Cl. D9-370.000.
Kelsey-Hayes Co.: *See—*
Reid, Donald J., 265,818, Cl. D12-211.000.
Reid, Donald J., 265,819, Cl. D12-211.000.
Kira, Yasuhiro; Watabiki, Yoshiro; Aiba, Nobushiro; and Koyama, Katsumi, to Nippon Gakki Seizo Kabushiki Kaisha. Electric organ. 265,832, 8-17-82, Cl. D17-5.000.
Kite, Kenneth M.; and Moine, David W., to CPG Products Corp. Electronic drag racing toy. 265,839, 8-17-82, Cl. D21-13.000.
Koyama, Katsumi: *See—*
Kira, Yasuhiro; Watabiki, Yoshiro; Aiba, Nobushiro; and Koyama, Katsumi, 265,832, Cl. D17-5.000.
Les Grands Chais deFrance: *See—*
Helfrich, Joseph, 265,794, Cl. D9-370.000.
M & M Luggage Co., Inc.: *See—*
Stark, Ted, 265,779, Cl. D3-71.000.
Maguire, Paul R. Lighting fixture for partition walls. 265,854, 8-17-82, Cl. D26-78.000.
Matre, Daniel A., to Harley Davidson Motor Co., Inc. Motorcycle handgrip control. 265,816, 8-17-82, Cl. D12-174.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Okada, Takao; Miyanaga, Setsuo; and Mishiro, Benito, 265,821, Cl. D14-5.000.
Meloy, Dennis V., to Camp International, Inc. Orthopedic garment. 265,853, 8-17-82, Cl. D24-64.000.
Mishiro, Benito: *See—*
Okada, Takao; Miyanaga, Setsuo; and Mishiro, Benito, 265,821, Cl. D14-5.000.
Miyanaga, Setsuo: *See—*
Okada, Takao; Miyanaga, Setsuo; and Mishiro, Benito, 265,821, Cl. D14-5.000.
Miyazaki, Takeshi: *See—*
Tomonaga, Keisuke; Nishida, Hiroshi; and Miyazaki, Takeshi, 265,820, Cl. D12-307.000.
Moine, David W.: *See—*
Kite, Kenneth M.; and Moine, David W., 265,839, Cl. D21-13.000.
Nakade, Kenichi, to Ricoh Company, Ltd. Sorter for electrostatic copier. 265,830, 8-17-82, Cl. D16-32.000.
Ng, Ying-Young, to Veny Plastic Co., Ltd. Aquarium gang valve. 265,849, 8-17-82, Cl. D23-19.000.
Nielsen, Vernon C. Game table. 265,847, 8-17-82, Cl. D21-232.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Kira, Yasuhiro; Watabiki, Yoshiro; Aiba, Nobushiro; and Koyama, Katsumi, 265,832, Cl. D17-5.000.
Nishida, Hiroshi: *See—*
Tomonaga, Keisuke; Nishida, Hiroshi; and Miyazaki, Takeshi, 265,820, Cl. D12-307.000.
Ohle, James L. Table. 265,782, 8-17-82, Cl. D6-146.000.
Okada, Takao; Miyanaga, Setsuo; and Mishiro, Benito, to Matsushita Electric Industrial Co., Ltd. Combined cassette recorder and radio receiver. 265,821, 8-17-82, Cl. D14-5.000.
Ortho Diagnostics, Inc.: *See—*
Owen, Newton C.; and Carver, Horace, 265,793, Cl. D9-341.000.
Osborne, Thomas P.: *See—*
Conners, Michael; and Osborne, Thomas P., 265,842, Cl. D21-150.000.
Ossola, Giuseppe, to Idropejo S.p.A. Beverage container. 265,798, 8-17-82, Cl. D9-429.000.
Ovation Instruments, Inc.: *See—*
Rickard, James H., 265,835, Cl. D17-21.000.
Owen, Newton C.; and Carver, Horace, to Ortho Diagnostics, Inc. Tablet dispenser. 265,793, 8-17-82, Cl. D9-341.000.
Paulson, Walter O., Jr. Short length gang rip saw. 265,827, 8-17-82, Cl. D15-133.000.
Platte, Richard L. Jug. 265,797, 8-17-82, Cl. D9-378.000.
Pomponi, Roman: *See—*
Foggia, Donald; and Pomponi, Roman, 265,824, Cl. D14-59.000.
Reid, Donald J., to Kelsey-Hayes Co. Vehicle wheel. 265,818, 8-17-82, Cl. D12-211.000.
Reid, Donald J., to Kelsey-Hayes Co. Vehicle wheel. 265,819, 8-17-82, Cl. D12-211.000.
Rickard, James H., to Ovation Instruments, Inc. Stringed instrument combined bridge and tailpiece. 265,835, 8-17-82, Cl. D17-21.000.
Ricoh Company, Ltd.: *See—*
Nakade, Kenichi, 265,830, Cl. D16-32.000.
Shimoda, Tsunezo, 265,829, Cl. D16-2.000.
Rubner, Karl-Heinz: *See—*
Schultes, Herbert; and Rubner, Karl-Heinz, 265,831, Cl. D16-42.000.
Russell William Ltd.: *See—*
Winter, Russell K.; Savas, Nedim; Snively, Joseph H.; and Harvey, Thomas D., 265,792, Cl. D8-394.000.
Saltzman, Ruth E. Display rack. 265,784, 8-17-82, Cl. D6-180.000.
Savas, Nedim: *See—*
Winter, Russell K.; Savas, Nedim; Snively, Joseph H.; and Harvey, Thomas D., 265,792, Cl. D8-394.000.
Schneider, Peter: *See—*
Hartwein, Peter; and Schneider, Peter, 265,822, Cl. D14-34.000.
Scholz, Helmut, to DSI-Sportartikel GmbH. Handle for ski pole. 265,846, 8-17-82, Cl. D21-230.000.
Schultes, Herbert; and Rubner, Karl-Heinz, to Agfa-Gevaert AG. Electronic flash device. 265,831, 8-17-82, Cl. D16-42.000.
Sciuto, Michael N. Bass guitar or similar article. 265,833, 8-17-82, Cl. D17-14.000.
Sciuto, Michael N. Bass guitar or similar article. 265,834, 8-17-82, Cl. D17-14.000.
Scott & Fetzer Company, The: *See—*
Burgoon, Jack L.; and Hayes, John M., 265,857, Cl. D32-32.000.
Sewell Plastics, Inc.: *See—*
Denhoff, Donald P., 265,796, Cl. D9-378.000.
Sharp Corporation: *See—*
Yamagami, Masafumi, 265,837, Cl. D18-7.000.
Shimoda, Tsunezo, to Ricoh Company, Ltd. Waterproof housing for camera. 265,829, 8-17-82, Cl. D16-2.000.
Simplex Time Recorder Co.: *See—*
Vickery, Dana L., 265,802, Cl. D10-118.000.
Simpson, Danny E.; and Williams, David M., to Johnson & Johnson Baby Products Company. Combined ball collection and receptacle. 265,844, 8-17-82, Cl. D21-204.000.
Sladky, Donald J., to Firestone Tire & Rubber Company, The. Tire. 265,813, 8-17-82, Cl. D12-152.000.
Snively, Joseph H.: *See—*
Winter, Russell K.; Savas, Nedim; Snively, Joseph H.; and Harvey, Thomas D., 265,792, Cl. D8-394.000.
Sorge, L. Ralph: *See—*
Holmstadt, Ronald J.; Sorge, L. Ralph; and Tiedemann, Robert J., 265,826, Cl. D15-12.000.
Spirk, John W., Jr., to Transco Plastics Corporation. Liquid dispenser handle for household scrubbing pad. 265,858, 8-17-82, Cl. D32-35.000.
Stark, Ted, to M & M Luggage Co., Inc. Garment bag. 265,779, 8-17-82, Cl. D3-71.000.
Suzuki, Takao, to Kabushiki Kaisha Daini Seikosha. Wristwatch. 265,799, 8-17-82, Cl. D10-39.000.
Swinn, Moyle A. Finger food attachment tray for a saucer. 265,788, 8-17-82, Cl. D7-39.000.
Tayclox Industries Pty. Limited: *See—*
Taylor, Andrew V., 265,790, Cl. D7-130.000.
Taylor, Andrew V., to Tayclox Industries Pty. Limited. Rack. 265,790, 8-17-82, Cl. D7-130.000.
Thermo Serv, Inc.: *See—*
Trombly, Edgar F., 265,789, Cl. D7-78.000.
TIE/Communications, Inc.: *See—*
Foggia, Donald; and Pomponi, Roman, 265,824, Cl. D14-59.000.
Tiedemann, Robert J.: *See—*
Holmstadt, Ronald J.; Sorge, L. Ralph; and Tiedemann, Robert J., 265,826, Cl. D15-12.000.
Tomonaga, Keisuke; Nishida, Hiroshi; and Miyazaki, Takeshi, to Kawasaki Jukogyo Kabushiki Kaisha. Motor boat. 265,820, 8-17-82, Cl. D12-307.000.
Toro Company, The: *See—*
Holmstadt, Ronald J.; Sorge, L. Ralph; and Tiedemann, Robert J., 265,826, Cl. D15-12.000.
Totten, Clayton. Combined aquarium and aviary. 265,856, 8-17-82, Cl. D30-11.000.

Transco Plastics Corporation: *See*—
Spirk, John W., Jr., 265,858, Cl. D32-35.000.

Trianco Redfyre Limited: *See*—
Babbage, Thomas A., 265,851, Cl. D23-128.000.

Trombly, Edgar F., to Thermo Serv, Inc. Ice bucket. 265,789, 8-17-82, Cl. D7-78.000.

Tung, Wai K., to Best Toys Co., Ltd., The. Animal figure toy. 265,843, 8-17-82, Cl. D21-156.000.

Tung, Wai-Kuen, to Best Toys Co. Ltd., The. Combined toy airplane and figure therefor. 265,841, 8-17-82, Cl. D21-90.000.

United States Borax & Chemical Corporation: *See*—
Keith, Keith S.; Hauser, Stephen G.; and Beach, Danny J., 265,795, Cl. D9-370.000.

Urbanek, Karel; and Bleiweiss, Arthur F., to Dominion Auto Accessories Limited. Marker lamp lens. 265,855, 8-17-82, Cl. D26-122.000.

Veny Plastic Co., Ltd.: *See*—
Ng, Ying-Young, 265,849, Cl. D23-19.000.

Vesper, James E. Room humidifier. 265,852, 8-17-82, Cl. D23-147.000.

Vickery, Dana L., to Simplex Time Recorder Co. Annunciator. 265,802, 8-17-82, Cl. D10-118.000.

W. H. Brine Company: *See*—
Brine, WilliamH., Jr.; and Brine, Peter J., 265,845, Cl. D21-210.000.

Watabiki, Yoshiro: *See*—
Kira, Yasuhiro; Watabiki, Yoshiro; Aiba, Nobushiro; and Koyama, Katsumi, 265,832, Cl. D17-5.000.

Weiskopf, John M. Easel. 265,785, 8-17-82, Cl. D6-180.000.

Williams, David M.: *See*—
Simpson, Danny E.; and Williams, David M., 265,844, Cl. D21-204.000.

Winter, Russell K.; Savas, Nedim; Snively, Joseph H.; and Harvey, Thomas D., to Russell William Ltd. Wedge clamp for panels or the like. 265,792, 8-17-82, Cl. D8-394.000.

Yamagami, Masafumi, to Sharp Corporation. Electronic calculating machine. 265,837, 8-17-82, Cl. D18-7.000.

LIST OF PLANT PATENTEES

Conard-Pyle Company: *See*—
Meserve, Kathleen K., 4,878, Cl. 65.000.

Meserve, Kathleen K., to Conard-Pyle Company. Ilex plant—Mesog variety. 4,878, 8-17-82, Cl. 65.000.

Mungia, Fred A., Sr. Rose plant. 4,876, 8-17-82, Cl. 6.000.

Urline, Adele: *See*—
Urline, Fred B., 4,877, Cl. 30.000.

Urline, Fred B., to Urline, Fred B.; and Urline, Adele. Almond tree. 4,877, 8-17-82, Cl. 30.000.

CLASSIFICATION OF PATENTS

ISSUED AUGUST 17, 1982

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

16 4,344,189

CLASS 3

1.9 4,344,190
4,344,191
1.91 4,344,192
1.911 4,344,193

CLASS 4

213 4,344,194

CLASS 5

11 4,344,195
496 4,344,196

CLASS 8

94.18 4,344,762
127.51 4,344,763
138 4,344,764
150 4,344,197
158 4,344,198
471 4,344,765
524 4,344,766

CLASS 12

54.3 4,344,199

CLASS 14

71.5 4,344,200

CLASS 15

3 4,344,201
4 4,344,202
21 A 4,344,203
93 A 4,344,204

CLASS 16

2 4,344,205
94 R 4,344,206

CLASS 17

63 4,344,207

CLASS 19

129 R 4,344,208

CLASS 23

230 R 4,344,768

CLASS 24

31 R 4,344,209
369 4,344,210

CLASS 28

183 4,344,211

CLASS 29

33 F 4,344,212
243.5 4,344,213
252 4,344,214
281.5 4,344,215
407 4,344,216
417 4,344,217
516 4,344,218
564.6 4,344,219
568 4,344,220
4,344,221
571 4,344,222
577 C 4,344,223
622 4,344,224
857 4,344,225

CLASS 30

31 4,344,226
41 4,344,227
43.9 4,344,228
166 R 4,344,229
272 R 4,344,230

CLASS 33

1 G 4,344,231
143 L 4,344,232
178 E 4,344,233
228 4,344,234
366 4,344,235

CLASS 34

110 4,344,236
191 4,344,237

CLASS 36

7.6 4,344,238

CLASS 37

66 4,344,239

CLASS 40

20 R 4,344,240
124.2 4,344,241
373 4,344,242
415 4,344,243
611 4,344,244

CLASS 42

1 R 4,344,245
69 B 4,344,246

CLASS 43

9 4,344,247
15 4,344,248

CLASS 44

23 4,344,769
50 4,344,770
63 4,344,771

CLASS 46

151 4,344,249

CLASS 47

57.5 4,344,250
80 4,344,251

CLASS 48

76 4,344,772
92 4,344,773

CLASS 49

199 4,344,252
383 4,344,253
401 4,344,254
501 4,344,255
4,344,256
504 4,344,257
4,344,258

CLASS 51

216 LP 4,344,259
283 E 4,344,260

CLASS 52

200 4,344,261
227 4,344,262
233 4,344,263
247 4,344,264
741 4,344,265
742 4,344,266
762 4,344,267

CLASS 53

384 4,344,268
459 4,344,269
511 4,344,270

CLASS 55

26 Re.31,014
41 4,344,774
75 4,344,775
129 4,344,776
178 4,344,777
180 4,344,778
233 4,344,779
347 4,344,780
379 4,344,781
397 4,344,782
459 B 4,344,783
473 4,344,784

CLASS 56

13.6 4,344,271
16.6 4,344,272
16.7 4,344,273
202 4,344,274
327 R 4,344,275
364 4,344,276

CLASS 57

22 4,344,277
221 4,344,278
232 4,344,279

CLASS 60

39.28 R 4,344,281
009 F 4,344,280
226 R 4,344,282
384 4,344,283
433 4,344,284
452 4,344,285
531 4,344,286
572 4,344,287
595 4,344,288
612 4,344,289

CLASS 62

48 4,344,290
62 4,344,291
114 4,344,292
126 4,344,293
155 4,344,294
4,344,295
175 4,344,296
196 C 4,344,297
347 4,344,298
448 4,344,299
457 4,344,300
4,344,301
514 R 4,344,302
530 4,344,303

CLASS 65

1 4,344,785
2 4,344,786
21.4 4,344,787

CLASS 66

84 R 4,344,307

CLASS 71

76 4,344,788
105 4,344,789
111 4,344,790

CLASS 72

39 4,344,308
199 4,344,309
225 4,344,310
391 4,344,311
452 4,344,312
453.1 4,344,313
461 4,344,314

CLASS 73

19 4,344,316
23 4,344,317
35 4,344,318
40.5 R 4,344,319
40.7 4,344,320
61.4 4,344,321
118 4,344,322
119 A 4,344,323
146 4,344,324
4,344,325
587 4,344,326
626 4,344,327
651 4,344,328
861 4,344,329
861.66 4,344,330
861.76 4,344,331

CLASS 74

54 4,344,332
199 4,344,333
473 R 4,344,334
674 4,344,335
690 4,344,336
740 4,344,337
752 C 4,344,338

CLASS 75

0.5 AA 4,344,791
9 4,344,792
81 4,344,793
173 C 4,344,794
230 4,344,795

CLASS 81

157 4,344,339
177 A 4,344,340

CLASS 83

29 4,344,341
45 4,344,342

CLASS 84

1.01 4,344,343
1.03 4,344,344
4,344,345
1.18 4,344,346
1.26 4,344,347
411 R 4,344,349

CLASS 89

1.805 4,344,592
33 E 4,344,350
129 B 4,344,351
199 4,344,352

CLASS 91

165 4,344,353
168 4,344,354
445 4,344,355

CLASS 98

2.11 4,344,356
50 4,344,357

CLASS 99

476 4,344,358
580 4,344,359

CLASS 101

363 4,344,360
425 4,344,361
4,344,362

CLASS 104

162 4,344,363

CLASS 105

62 R 4,344,364
282 A 4,344,365
378 4,344,366

CLASS 106

84 4,344,796
4,344,797
123 LC 4,344,798
300 4,344,799
308 Q 4,344,800

CLASS 108

1 4,344,367
51.1 4,344,368
84 4,344,369

CLASS 110

162 4,344,370
229 4,344,371
245 4,344,372
347 4,344,373

CLASS 111

2 4,344,374

CLASS 112

131 4,344,375
200 4,344,376

CLASS 114

103 4,344,377
218 4,344,378

CLASS 118

44 4,344,379
66 4,344,380
626 4,344,381
674 4,344,382
730 4,344,383

CLASS 119

4 4,344,384
14.08 4,344,385

CLASS 122

19 4,344,386
34 4,344,387
235 R 4,344,388

CLASS 123

25 B 4,344,389
41.82 A 4,344,390
146.5 A 4,344,391
179 G 4,344,392
198 F 4,344,393
306 4,344,394
335 4,344,395
337 4,344,396
339 4,344,397
4,344,398
4,344,399
425 4,344,400
536 4,344,401
538 4,344,402
4,344,403
4,344,404
568 4,344,405
587 4,344,406
661 4,344,407
4,344,408

CLASS 124

24 R 4,344,409
80 4,344,410

CLASS 126

34 4,344,411
298 4,344,412
429 4,344,413
434 4,344,414
4,344,415
438 4,344,416
439 4,344,417
443 4,344,418

CLASS 128

18 4,344,419
20 4,344,420
24 R 4,344,421
33 4,344,422
90 4,344,423
136 4,344,424
152 4,344,425
156 4,344,426
200.25 4,344,427
207.14 4,344,428
214 R 4,344,429
233 4,344,430
260 4,344,431
275 4,344,432
283 4,344,433
4,344,434
350 R 4,344,435
4,344,436
419 PG 4,344,437
634 4,344,438
636 4,344,439
653 4,344,440
733 4,344,441

CLASS 130

27 T 4,344,442
272 4,344,443

CLASS 131

201 4,344,444
282 4,344,445

CLASS 132

7 4,344,446
42 R 4,344,447

CLASS 134

73 4,344,448

CLASS 136

255 4,345,107

CLASS 137

1 4,344,449
62 4,344,450
101 4,344,451
238 4,344,452
240 4,344,453
315 4,344,454
329.4 4,344,455
403 4,344,456
597 4,344,457

CLASS 138

30 4,344,458
45 4,344,459
89 4,344,460
109 4,344,461
130 4,344,462

CLASS 139

383 A 4,344,464
383 R 4,344,463
435 4,344,465
449 4,344,466

CLASS 141

66 4,344,467
69 4,344,468
90 4,344,469

CLASS 144

2 Z 4,344,470
345 4,344,471

CLASS 148

3 4,344,801
27 4,344,802
33.3 4,344,803

CLASS 150

8 4,344,472

CLASS 156

42 4,344,804
61 4,344,805
154 4,344,806
155 4,344,807
166 4,344,808
345 4,344,809
379.7 4,344,810
397 4,344,811
499 4,344,812
527 4,344,813
581 4,344,814
601 4,344,815
643 4,344,816
645 4,344,817

CLASS 160

121 R 4,344,473
4,344,474
135 4,344,475

CLASS 162

111 4,344,818

CLASS 164

76.1 4,344,476
98 4,344,477

CLASS 165

69 4,344,478
109 R 4,344,479
162 4,344,480
166 4,344,481
172 4,344,482

CLASS 166

248 4,344,483
251 4,344,484
271 4,344,485
272 4,344,486
274 4,344,487
303 4,344,488

CLASS 169

70 4,344,489

CLASS 172

253 4,344,490

CLASS 174

52 H 4,345,108
84 R 4,345,109
87 4,345,110
102 A 4,345,111
107 4,345,112

CLASS 175

317 4,344,491

CLASS 177

25 4,344,492
52 4,344,493
210 R 4,344,494
211 4,344,495
4,344,496

CLASS 179

2 A 4,345,113
6.16 4,345,114
18 EA 4,345,116
18 FA 4,345,115
77 4,345,117
110 A 4,345,118

CLASS 180

41 4,344,497
168 4,344,498
197 4,344,499
230 4,344,500
253 4,344,501
268 4,344,502

CLASS 181

170 4,344,503
187 4,344,504

CLASS 182

47 4,344,505

CLASS 184

6.11 4,344,506
6.18 4,344,507

CLASS 187

9 R 4,344,508

CLASS 188

1.11 4,344,509
71.9 4,344,510
73.45 4,344,511
79.5 GE 4,344,512

CLASS 192

3.58 4,344,514
67 R 4,344,515
98 4,344,517
.02 R 4,344,513
111 A 4,344,518
114 R 4,344,516

CLASS 193

2 R 4,344,519

CLASS 198

347 4,344,520
404 4,344,521
419 4,344,522
424 4,344,523
494 4,344,524
499 4,344,525
689 4,344,526
781 4,344,527

CLASS 200

5 A 4,345,119
19 R 4,345,120
42 R 4,345,121
50 B 4,345,122
52 R 4,345,123
61.53 4,345,124
67 D 4,345,125
144 B 4,345,126
148 R 4,345,127
153 J 4,345,128
163 4,345,129
268 4,345,130

CLASS 201

1 4,344,819
15 4,344,820
33 4,344,821
39 4,344,822
41 4,344,823

CLASS 202

234 4,344,824

CLASS 203

1 4,344,825
2 4,344,826
13 4,344,827
19 4,344,828

CLASS 204

72 4,344,829
159.16 4,344,830
228 4,344,831
258 4,344,832
4,344,833
278 4,344,834

CLASS 206

3 4,344,528
77.1 4,344,529
203 4,344,530
339 4,344,531
370 4,344,532
459 4,344,533
545 4,344,534
581 4,344,535
594 4,344,536
611 4,344,537

CLASS 208

8 LE 4,344,837
8 R 4,344,835
4,344,836
10 4,344,838
11 R 4,344,839
59 4,344,840
211 4,344,841
244 4,344,842

CLASS 209

143 4,344,843
144 4,344,538
168 4,344,844
564 4,344,539

CLASS 210

199 4,344,845
503 4,344,846
600 4,344,847
617 4,344,848
662 4,344,849
664 4,344,850
670 4,344,851

CLASS 211

106 4,344,540

CLASS 213

61 4,344,541
188 4,344,542

CLASS 219

10.55 B 4,345,132
4,345,134
4,345,135
10.55 E 4,345,133
69 G 4,345,131
120 4,345,136
121 LF 4,345,138
121 PK 4,345,137
137 PS 4,345,139
146.23 4,345,140
207 4,345,141
390 4,345,142
411 4,345,143
413 4,345,144
492 4,345,145

CLASS 220

1 B 4,344,543
86 AT 4,344,544
307 4,344,545
320 4,344,546

CLASS 222

146 HE 4,344,547
209 4,344,548
465 A 4,344,549
600 4,344,550

CLASS 225

86 4,344,551

CLASS 226

95 4,344,552
168 4,344,553

CLASS 227

30 4,344,554
130 4,344,555

CLASS 228

50 4,344,556

CLASS 229

53 4,344,557
62.5 4,344,558

CLASS 232

35 4,344,559

CLASS 233

19 A 4,344,560
24 4,344,561
26 4,344,562
4,344,563

CLASS 235

381 4,345,146
385 4,345,147

CLASS 236

34.5 4,344,564
46 R 4,344,565
92 B 4,344,566

CLASS 237

1 R 4,344,567
8 R 4,344,568
12.1 4,344,569

CLASS 239

67 4,344,570
130 4,344,571
168 4,344,572
320 4,344,573
338 4,344,574
533.5 4,344,575
542 4,344,576
546 4,344,577
583 4,344,578

CLASS 241

34 4,344,579
60 4,344,580
88.4 4,344,581

CLASS 242

45 4,344,582
55.2 4,344,583
56 A 4,344,584
66 4,344,585
84.5 A 4,344,586
106 4,344,587
107.4 A 4,344,588
4,344,589
201 4,344,590

CLASS 244

158 A 4,344,591

CLASS 248

73 4,344,593
421 4,344,594
542 4,344,595
550 4,344,596
561 4,344,597
651 4,344,598
660 4,344,599

CLASS 249

88 4,344,600
167 4,344,601

CLASS 250

214 C 4,345,148
231 SE 4,345,149
339 4,345,150
341 4,345,151
369 4,345,153
375 4,345,154
385 4,345,155
4,345,156
396 ML 4,345,152

CLASS 251

58 4,344,602
130 4,344,603

CLASS 252

33.6 4,344,853
45 4,344,854
182 4,344,855
192 4,344,863
299.61 4,344,856
316 4,344,857
358 4,344,858
359 D 4,344,859
389 R 4,344,860
391 4,344,861
4,344,862
408 4,344,864
420 4,344,865
428 4,344,866
439 4,344,867
455 Z 4,344,868
517 4,344,869
4,344,870
531 4,344,871
629 4,344,872

CLASS 256

65 4,344,604

CLASS 260

146 R 4,344,879
152 4,344,880
397.2 4,344,888
400 4,344,889
429 K 4,344,890
453 A 4,344,891
453 AM 4,344,892
456 A 4,344,893
465 D 4,344,894
465 F 4,344,895
465.1 4,344,896
502 R 4,344,897

CLASS 261

39 E 4,344,898
112 4,344,899
114 VT 4,344,900

CLASS 264

23 4,344,901
51 4,344,902
55 4,344,903
66 4,344,904
111 4,344,905
128 4,344,906
173 4,344,907
203 4,344,908
230 4,344,909
257 4,344,910

CLASS 266

48 4,344,605
66 4,344,606
198 4,344,607
245 4,344,608

CLASS 269

27 4,344,609

CLASS 270

6 4,344,610

CLASS 271

129 4,344,611
162 4,344,612
165 4,344,613
288 4,344,614

CLASS 272

67 4,344,615
69 4,344,616
109 4,344,617
117 4,344,618
4,344,619
119 4,344,620

CLASS 273

26 A 4,344,621
85 G 4,344,622
153 S 4,344,623
176 F 4,344,624
242 4,344,625
243 4,344,626
273 4,344,627
388 4,344,628

CLASS 277

1 4,344,629
4 4,344,630
29 4,344,631
152 4,344,632
228 4,344,633
236 4,344,634

CLASS 280

5 C 4,344,636
21 R 4,344,637
411 C 4,344,639
414.1 4,344,635
432 4,344,640
601 4,344,641
682 4,344,642
724 4,344,643
763 Re.31,011

CLASS 283

19 4,344,644

CLASS 285

61 4,344,645
114 Re.31,012

CLASS 290

43 4,345,159
52 4,345,160
55 4,345,161

CLASS 292

87 4,344,646
201 4,344,647

CLASS 294

55 4,344,648

CLASS 297

30 4,344,649

CLASS 299

4 4,344,650
5 4,344,651
70 4,344,652

CLASS 301

2.5 4,344,655
37 R 4,344,654
37 T 4,344,653

CLASS 303

2 4,344,656

CLASS 307

39 4,345,162
252 A 4,345,163
255 4,345,164
265 4,345,165
296 R 4,345,166
308 4,345,167
351 4,345,168
354 4,345,169
443 4,345,170
560 4,345,171
562 4,345,172

CLASS 308

6 C 4,344,657
8.2 4,344,658
187.1 4,344,659

CLASS 310

11 4,345,173
24 4,345,174
45 4,345,175
313 A 4,345,176

CLASS 312

250 4,344,660
330 R 4,344,661

CLASS 313

95 4,345,177
113 4,345,178
136 4,345,179
221 4,345,180
309 4,345,181
348 4,345,182
412 4,345,183
475 4,345,184

CLASS 315

3 4,345,185
49 4,345,186
408 4,345,187
411 4,345,188

CLASS 318

317 4,345,189
338 4,345,190
564 4,345,191
592 4,345,192
612 4,345,193
621 4,345,194
628 4,345,195
812 4,345,196

CLASS 320

6 4,345,197

CLASS 322

25 4,345,198
28 4,345,199

CLASS 323

350 4,345,200

CLASS 324

52 4,345,201
58.5 B 4,345,202
61 R 4,345,203
4,345,204
65 R 4,345,205
79 R 4,345,206
308 4,345,207
329 4,345,208

CLASS 328

120 4,345,209
234 4,345,210

CLASS 329

50 4,345,211

CLASS 330

4.3 4,345,212
253 4,345,213
254 4,345,214
268 4,345,215
288 4,345,216
4,345,217
298 4,345,218

CLASS 331

1 A 4,345,219
79 4,345,220
176 4,345,221

CLASS 333

28 R 4,345,222

CLASS 335

6 4,345,223
132 4,345,224
4,345,225
166 4,345,226
186 4,345,227
222 4,345,228

CLASS 336

83 4,345,229
135 4,345,230
192 4,345,231
210 4,345,232

CLASS 337

75 4,345,233
336 4,345,234

CLASS 338

176 4,345,235
4,345,236

CLASS 339

59 M 4,344,662
75 M 4,344,663
99 R 4,344,664
4,344,665

CLASS 340

27 R 4,345,237
52 R 4,345,238
146.3 SY 4,345,239
345 4,345,240
347 CC 4,345,241
634 4,345,242
728 4,345,243
4,345,244
744 4,345,245
748 4,345,246
755 4,345,247
784 4,345,248
4,345,249
825.5 4,345,250
825.86 4,345,251

CLASS 343

5 NQ 4,345,252
6.8 LC 4,345,253
18 B 4,345,254
100 PE 4,345,255
754 4,345,256
780 4,345,257

CLASS 346

17 4,345,258
75 4,345,259
4,345,260
76 L 4,345,261
140 R 4,345,262
4,345,263
154 4,345,264

CLASS 350

6.9 4,344,666
80 4,344,667
96.27 4,344,668
96.30 4,344,669
96.31 4,344,670
174 4,344,671
288 4,344,672
292 4,344,673
357 4,344,674
358 4,344,675
444 4,344,676

CLASS 354

5 4,344,677
23 D 4,344,678
25 4,344,679
33 4,344,680
38 4,344,681
62 4,344,682
106 4,344,683
128 4,344,684
173 4,344,685
198 4,344,686
246 4,344,687
272 4,344,688
286 4,344,689
319 4,344,690

CLASS 355

1 4,344,691
3 BE 4,344,693
3 DD 4,344,692
4,344,694
3 SC 4,344,700
8 4,344,695
4,344,696
14 C 4,344,697
16 4,344,698
20 4,344,699
51 4,344,701
67 4,344,702
76 4,344,703
77 4,344,704

CLASS 356

5 4,344,705
350 4,344,706
354 4,344,707
404 4,344,708
445 4,344,709

CLASS 357

23 4,345,265
34 4,345,266
81 4,345,267

CLASS 358

21 R 4,345,272
31 4,345,268
43 4,345,269
44 4,345,270
55 4,345,271
86 4,345,273
108 4,345,274
243 4,345,275
258 4,345,276
293 4,345,277

CLASS 360

2 4,345,278
36 4,345,279
49 4,345,280
66 4,345,281
85 4,345,282
96.6 4,345,283
132 4,345,284
133 4,345,285
137 4,345,286
4,345,287

CLASS 361

31 4,345,288
45 4,345,289
56 4,345,290
68 4,345,291
94 4,345,292
117 4,345,293
119 4,345,294
130 4,345,295
154 4,345,296
215 4,345,297
273 4,345,298

283 4,345,299
386 4,345,300
400 4,345,301
433 4,345,302

CLASS 362

80 4,345,303
183 4,345,304
186 4,345,305
294 4,345,306
306 4,345,307
332 4,345,308

CLASS 364

200 4,345,309
429 4,345,310
483 4,345,311
515 4,345,312
4,345,313
4,345,314
900 4,345,315
4,345,316

CLASS 365

9 4,345,317
196 4,345,318
210 4,345,319

CLASS 366

76 4,344,710
83 4,344,711
108 4,344,712

CLASS 368

87 4,345,320

CLASS 369

46 4,345,321
139 4,345,322

CLASS 370

9 4,345,323
14 4,345,324
29 4,345,325
60 4,345,326

CLASS 371

9 4,345,327
38 4,345,328

CLASS 372

2 4,345,329
29 4,345,330
87 4,345,331

CLASS 373

27 4,345,106
74 4,345,332
94 4,345,333

CLASS 374

44 4,344,315

CLASS 376

102 4,344,911
180 4,344,912
317 4,344,913
437 4,344,914
4,344,915

CLASS 378

5 4,345,158
19 4,345,157

CLASS 400

22 4,344,713
334.3 4,344,714
616.1 4,344,715

CLASS 403

13 4,344,716
14 4,344,717
27 Re.31,013
287 4,344,718
297 4,344,719

CLASS 405

41 4,344,720
224 4,344,721
270 4,344,722

CLASS 406

53 4,344,723

CLASS 407

36 4,344,724
114 4,344,725

CLASS 410

79 4,344,726

CLASS 414

36 4,344,727
39 4,344,728
226 4,344,729
405 4,344,730
471 4,344,731
607 4,344,732
694 4,344,733
710 4,344,734

CLASS 415

95 4,344,738
141 4,344,739
221 4,344,740

CLASS 417

28 4,344,741
317 4,344,743
343 4,344,742
550 4,344,744

CLASS 418

132 4,344,745
270 4,344,746

CLASS 422

40 4,344,916
78 4,344,917
80 4,344,918
133 4,344,919
169 4,344,920
179 4,344,921
4,344,922

CLASS 423

20 4,344,923
54 4,344,924
170 4,344,925
244 4,344,926
339 4,344,927
626 4,344,928

CLASS 424

15 4,344,929
28 4,344,930
52 4,344,931
61 4,344,932
78 4,344,875
79 4,344,933
80 4,344,934
89 4,344,935
101 4,344,936
177 4,344,938
180 4,344,937
226 4,344,939
241 4,344,940
243 4,344,941
4,344,942
245 4,344,943
246 4,344,944
248.52 4,344,945
250 4,344,946
251 4,344,947
4,344,948
258 4,344,949
262 4,344,950
263 4,344,951
267 4,344,952
269 4,344,953
270 4,344,954
271 4,344,955
272 4,344,956
273 B 4,344,957
273 R 4,344,958
279 4,344,959
282 4,344,960
285 4,344,961
300 4,344,962
304 4,344,963
4,344,964
310 4,344,965
343 4,344,966
359 4,344,967
365 4,344,968

CLASS 425

140 4,344,747
143 4,344,748
174.4 4,344,749
548 4,344,750

CLASS 426

18 4,344,969
40 4,344,970
102 4,344,971
103 4,344,972
264 4,344,973
271 4,344,974
285 4,344,975
472 4,344,976
532 4,344,977
600 4,344,978

CLASS 427

4 4,344,979
38 4,344,980
40 4,344,981
44 4,344,982
46 4,344,983
74 4,344,984
85 4,344,985
180 4,344,986
213 4,344,987
255.5 4,344,988
286 4,344,989
4,344,990
325 4,344,991
430.1 4,344,992

CLASS 428

35 4,344,993
41 4,344,994
61 4,344,995
141 4,344,996
161 4,344,997
212 4,344,998
4,344,999
4,345,000
286 4,345,001
288 4,345,002
327 4,345,003
416 4,345,004
461 4,345,005
473 4,345,006
679 4,345,007

CLASS 429

26 4,345,008
37 4,345,009
197 4,345,010

CLASS 430

7 4,345,011
48 4,345,012
106.6 4,345,013
122 4,345,014
137 4,345,015
214 4,345,016
221 4,345,017
234 4,345,018
4,345,019
270 4,345,020
321 4,345,021
329 4,345,022
364 4,345,023
382 4,345,024
385 4,345,025

CLASS 431

202 4,344,751
354 4,344,752

CLASS 432

3 4,344,753
233 4,344,754

CLASS 433

76 4,344,755
92 4,344,756
137 4,344,758
173 4,344,757

CLASS 434

236 4,344,759

CLASS 435

4 4,345,026
21 4,345,027
30 4,345,028
55 4,345,029
4,345,030
137 4,345,031
253 4,345,032
4,345,033
4,345,034

CLASS 440

3 4,344,760

CLASS 455

50 4,345,334

CLASS 464

34 4,344,306
85 4,344,304
169 4,344,305

CLASS 474

245 4,344,761

CLASS 501

29 4,345,035
37 4,345,036
38 4,345,037

CLASS 518

711 4,345,038

CLASS 521

48 4,345,039
53 4,345,040
94 4,345,041
112 4,345,042

CLASS 523

209 4,345,043
220 4,345,044

CLASS 524

91 4,344,876
102 4,344,877
159 4,344,767
180 4,345,045
223 4,345,046
296 4,344,874
409 4,344,878

CLASS 525

108 4,345,047
192 4,345,048
339 4,345,049
390 4,345,050
4,345,051
411 4,345,052
440 4,345,053
480 4,345,054

CLASS 526

96 4,345,055
200 4,345,056
247 4,345,057

CLASS 528

48 4,345,058
58 4,344,873
102 4,345,059
103 4,345,060
161 4,345,061
198 4,345,062
245 4,345,063
288 4,345,064
312 4,345,065
324 4,345,066
485 4,345,067

CLASS 536

7.1 4,345,069
17 A 4,345,068
4,345,070

CLASS 542

420 4,345,071
442 4,345,072

CLASS 544

70 4,345,073
99 4,345,074
182 4,345,075
241 4,345,076
4,345,077
244 4,345,078
351 4,345,079

CLASS 546

6 4,345,080
17 4,345,081
51 4,345,082
163 4,345,083

CLASS 548

237 4,345,084
360 4,345,085

CLASS 549

16 4,345,086
44 4,345,087
229 4,344,881
273 4,344,884
291 4,344,885
387 4,344,882
408 4,344,886
467 4,344,883
531 4,344,887

CLASS 556

410 4,345,088

CLASS 560

77 4,345,089
124 4,345,090
163 4,345,091
182 4,345,092
205 4,345,093

CLASS 562

425 4,345,094
4,345,095
465 4,345,096
472 4,345,097
482 4,345,098

CLASS 564

63 4,345,099
124 4,345,100
206 4,345,101

CLASS 568

678 4,345,102
840 4,345,103
852 4,345,104

CLASS 585

271 4,345,105

CLASSIFICATION OF DESIGNS

D2— 29 265,775
274 265,776
D3— 35 265,777
61 265,778
71 265,779
D6— 9 265,780
15 265,781
146 265,782
162 265,783
180 265,784
265,785
265,786
196 265,787
D7— 39 265,788
78 265,789
130 265,790
D8— 88 265,791
394 265,792
D9— 341 265,793
370 265,794
265,795
378 265,796
265,797
429 265,798
D10— 39 265,799
57 265,800
96 265,801
118 265,802
D11— 8 265,803
265,804
265,805
265,806
265,807
26 265,808
34 265,809
265,810
76 265,811
D12— 123 265,812
152 265,813
157 265,814
265,815
174 265,816
179 265,817
211 265,818
265,819
307 265,820
D14— 5 265,821
34 265,822
265,823
59 265,824
81 265,825
D15— 12 265,826
133 265,827
144 265,828
D16— 2 265,829
32 265,830
42 265,831
D17— 5 265,832
14 265,833
265,834
21 265,835
24 265,836
D18— 7 265,837
D19— 41 265,838
D21— 13 265,839
24 265,840
90 265,841
150 265,842
156 265,843
204 265,844
210 265,845
230 265,846
232 265,847
D23— 1 265,848
19 265,849
97 265,850
128 265,851
147 265,852
D24— 64 265,853
D26— 78 265,854
122 265,855
D30— 11 265,856
D32— 32 265,857
35 265,858
D99— 32 265,859

CLASSIFICATION OF PLANTS

P.— 6 4,876
30 4,877
65 4,878

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,344,211
4,344,218
4,344,627
4,344,732
4,345,105
4,345,168
4,345,181
02 : 4,344,414
04 : 4,344,339
4,344,374
4,344,390
4,344,737
4,345,166
4,345,195
4,345,206
4,345,217
4,345,250
05 : 4,344,821
4,345,097
06 : 4,344,191
4,344,214
4,344,231
4,344,234
4,344,242
4,344,249
4,344,250
4,344,263
4,344,264
4,344,272
4,344,302
4,344,306
4,344,347
4,344,350
4,344,352
4,344,384
4,344,405
4,344,424
4,344,434
4,344,435
4,344,446
4,344,447
4,344,458
4,344,459
4,344,469
4,344,476
4,344,484
4,344,529
4,344,532
4,344,542
4,344,553
4,344,576
4,344,585
4,344,588

4,344,593
4,344,604
4,344,615
4,344,619
4,344,622
4,344,629
4,344,635
4,344,667
4,344,668
4,344,671
4,344,673
4,344,675
4,344,707
4,344,712
4,344,715
4,344,726
4,344,728
4,344,743
4,344,770
4,344,777
4,344,809
4,344,810
4,344,811
4,344,813
4,344,864
4,344,883
4,344,896
4,344,911
4,344,914
4,344,918
4,344,927
4,344,929
4,344,943
4,345,013
4,345,027
4,345,075
4,345,076
4,345,077
4,345,098
4,345,099
4,345,128
4,345,147
4,345,148
4,345,149
4,345,167
4,345,177
4,345,184
4,345,193
4,345,212
4,345,218
4,345,235
4,345,244
4,345,253

4,345,254
4,345,256
4,345,258
4,345,261
4,345,265
4,345,285
4,345,297
08 : 4,344,230
4,344,278
4,344,473
4,344,691
4,345,280
09 : 4,344,227
4,344,229
4,344,361
4,344,406
4,344,410
4,344,481
4,344,559
4,344,563
4,344,676
4,344,738
4,344,742
4,344,768
4,344,849
4,344,850
4,344,902
4,345,008
4,345,009
4,345,122
4,345,145
4,345,176
4,345,187
4,345,224
4,345,289
10 : 4,344,197
4,344,431
4,344,468
4,344,890
4,344,965
4,344,999
4,345,079
4,345,092
11 : 4,344,787
12 : 4,344,261
4,344,282
4,344,299
4,344,319
4,344,333
4,344,341
4,344,551
4,344,558
4,344,587

4,344,648
4,344,727
4,344,740
4,344,779
4,344,844
4,344,859
4,344,861
4,344,920
4,345,002
4,345,146
4,345,161
4,345,169
4,345,174
4,345,205
4,345,219
4,345,276
13 : 4,344,209
4,344,288
4,344,489
4,344,534
4,344,620
4,345,160
17 : 4,344,210
4,344,213
4,344,224
4,344,274
4,344,287
4,344,291
4,344,323
4,344,340
4,344,342
4,344,346
4,344,365
4,344,366
4,344,376
4,344,385
4,344,429
4,344,432
4,344,460
4,344,472
4,344,523
4,344,540
4,344,541
4,344,545
4,344,546
4,344,555
4,344,626
4,344,656
4,344,755
4,344,759
4,344,831
4,344,857
4,344,913

4,345,047
4,345,119
4,345,144
4,345,163
4,345,231
345,299
4,345,307
4,345,308
18 : 4,344,232
4,344,281
4,344,381
4,344,419
4,344,456
4,344,475
4,344,510
4,344,512
4,344,537
4,344,543
4,344,568
4,344,616
4,344,621
4,344,733
4,344,822
4,344,958
4,345,188
4,345,197
4,345,199
4,345,208
4,345,251
4,345,275
4,345,300
19 : 4,344,245
4,344,271
4,344,356
4,344,497
4,344,583
4,344,716
4,344,734
4,344,971
4,345,211
4,345,234
20 : 4,344,285
4,344,702
4,344,719
4,344,900
21 : 4,344,257
4,344,269
4,344,294
4,344,991
4,345,135
22 : 4,344,251
4,344,867

4,345,039
23 : 4,344,411
24 : 4,344,298
4,344,628
4,344,647
4,344,763
4,344,875
4,345,153
4,345,154
25 : 4,344,193
4,344,199
4,344,205
4,344,248
4,344,315
4,344,549
4,344,664
4,344,807
4,344,808
4,344,826
4,345,017
4,345,018
4,345,023
4,345,026
4,345,178
4,345,305
4,345,309
4,345,331
4,345,334
26 : Re.31,011
Re.31,012
Re.31,013
4,344,217
4,344,244
4,344,256
4,344,265
4,344,295
4,344,331
4,344,332
4,344,336
4,344,369
4,344,415
4,344,428
4,344,438
4,344,440
4,344,467
4,344,470
4,344,507
4,344,518
4,344,589
4,344,624
4,344,653
4,344,654
4,344,661

4,344,701
4,344,725
4,344,758
4,344,800
4,344,860
4,344,881
4,344,882
4,344,949
4,344,993
4,345,029
4,345,030
4,345,033
4,345,034
4,345,086
4,345,202
4,345,207
27 : 4,344,324
4,344,328
4,344,402
4,344,403
4,344,404
4,344,437
4,344,478
4,344,572
4,344,618
4,344,784
4,344,814
4,345,028
4,345,152
4,345,162
4,345,290
4,345,301
4,345,328
28 : 4,344,413
29 : 4,344,255
4,344,267
4,344,422
4,344,617
4,344,842
4,344,901
30 : 4,344,409
31 : 4,344,314
4,344,564
34 : 4,344,196
4,344,326
4,344,349
4,344,371
4,344,379
4,344,383
4,344,388
4,344,423
4,344,491
4,344,493
4,344,522
4,344,596

4,344,598
4,344,644
4,344,649
4,344,650
4,344,662
4,344,706
4,344,752
4,344,775
4,344,781
4,344,788
4,344,793
4,344,805
4,344,816
4,344,838
4,344,840
4,344,846
4,344,853
4,344,863
4,344,868
4,344,878
4,344,885
4,344,940
4,344,954
4,344,966
4,344,982
4,344,985
4,345,038
4,345,046
4,345,053
4,345,059
4,345,081
4,345,084
4,345,087
4,345,096
4,345,109
4,345,116
4,345,170
4,345,213
4,345,214
4,345,216
4,345,317
4,345,318
35 : 4,344,351
4,344,449
4,344,651
4,345,124
4,345,220
36 : 4,344,226
4,344,238
4,344,243
4,344,246
4,344,259
4,344,262
4,344,367
4,344,378
4,344,417

4,344,427
4,344,430
4,344,464
4,344,474
4,344,479
4,344,488
4,344,533
4,344,554
4,344,562
4,344,578
4,344,612
4,344,631
4,344,670
4,344,674
4,344,677
4,344,687
4,344,693
4,344,698
4,344,710
4,344,830
4,344,851
4,344,865
4,344,887
4,344,903
4,344,907
4,344,932
4,344,934
4,344,970
4,344,992
4,345,005
4,345,007
4,345,010
4,345,011
4,345,022
4,345,044
4,345,050
4,345,051
4,345,061
4,345,062
4,345,085
4,345,088
4,345,110
4,345,113
4,345,126
4,345,175
4,345,198
4,345,200
4,345,229
4,345,230
4,345,236
4,345,239
4,345,245
4,345,266
4,345,274
4,345,281
4,345,298

4,345,313
37 : 4,344,505
4,344,531
4,344,828
4,344,973
4,345,278
4,345,306
38 : 4,344,276
4,344,723
39 : 4,344,240
4,344,253
4,344,370
4,344,416
4,344,425
4,344,455
4,344,527
4,344,544
4,344,557
4,344,569
4,344,582
4,344,600
4,344,633
4,344,709
4,344,747
4,344,789
4,344,802
4,344,806
4,344,854
4,344,858
4,344,866
4,344,871
4,344,969
4,344,990
4,344,996
4,345,040
4,345,045
4,345,058
4,345,080
4,345,106
4,345,136
40 : 4,344,364
4,344,450
4,344,486
4,344,580
4,344,586
4,344,754
4,344,771
4,344,825
4,344,841
4,344,917
4,345,055
4,345,165
42 : Re.31,014
4,344,203
4,344,216

4,344,223
4,344,225
4,344,290
4,344,368
4,344,442
4,344,480
4,344,504
4,344,524
4,344,528
4,344,567
4,344,607
4,344,625
4,344,632
4,344,637
4,344,646
4,344,660
4,344,665
4,344,713
4,344,729
4,344,748
4,344,756
4,344,785
4,344,796
4,344,798
4,344,819
4,344,892
4,344,912
4,344,936
4,344,977
4,344,986
4,345,083
4,345,107
4,345,204
4,345,232
4,345,267
4,345,304
4,345,323
43 : 4,344,329
44 : 4,344,645
45 : 4,344,236
4,344,730
4,344,786
4,345,063
4,345,139
47 : 4,344,548
4,344,820
4,344,833
4,345,194
4,345,315
48 : 4,344,194
4,344,215
4,344,235
4,344,303
4,344,386
4,344,433

4,344,454
4,344,487
4,344,539
4,344,570
4,344,602
4,344,658
4,344,718
4,344,721
4,344,774
4,344,817
4,344,916
4,344,926
4,345,048
4,345,093
4,345,141
4,345,171
4,345,222
4,345,247
49 : 4,344,200
50 : 4,344,222
51 : 4,344,372
4,344,412
4,344,547
4,344,591
4,344,699
4,344,824
4,344,980
4,345,143
53 : 4,344,189
4,344,296
4,344,441
4,344,556
4,344,915
4,344,995
4,345,173
4,345,182
4,345,191
54 : 4,344,643
4,345,094
4,345,095
4,345,103
4,345,104
55 : 4,344,330
4,344,394
4,344,519
4,344,584
4,344,597
4,344,818
4,345,121
4,345,133
4,345,233
4,345,242
4,345,288
4,345,291
4,345,292

DESIGN PATENTS

06 : 265,777
265,785
265,795
265,800
265,812
265,836
265,838
265,840
265,854
08 : 265,801

09 : 265,835
12 : 265,803
265,804
265,805
265,806
265,807
265,808
265,809
265,810
265,811

265,859
13 : 265,796
17 : 265,782
265,817
24 : 265,792
265,833
265,834
265,844
265,852
25 : 265,802

265,815
265,845
26 : 265,789
265,797
265,818
265,819
265,853
27 : 265,787
265,826
34 : 265,779

265,793
265,824
37 : 265,850
265,856
39 : 265,783
265,813
265,828
265,839
265,842
265,857

265,858
40 : 265,781
41 : 265,784
265,827
42 : 265,776
265,791
47 : 265,786
49 : 265,847
51 : 265,775
55 : 265,816

PLANT PATENTS

06 : 4,876

4,877

36 : 4,878

U.S. GOVERNMENT PRINTING OFFICE : O—1982

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ **Domestic; @ $** **Foreign.**

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

U.S. DEPARTMENT OF COMMERCE
Malcolm Baldrige, *Secretary*

PATENT AND TRADEMARK OFFICE
Gerald J. Mossinghoff, *Commissioner*